

**Senior 1 Mathematics
Standards Test**

**Administration Manual
for Supervising Teachers**

January 2004

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Manitoba Education and Youth,
Assessment and Evaluation Branch,
Winnipeg, Manitoba R3E 3J5

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Preface

This *Administration Manual for Supervising Teachers* is distributed to teachers and administrators, and must be read prior to administering the standards test. The rules and guidelines in this manual must be strictly observed to ensure the consistency of standards test administration.

Please use this manual in conjunction with the registration package, the *Policies and Procedures for Standards Tests* handbook and the *Information Bulletin* (these documents are available on our website at: <http://www.edu.gov.mb.ca/ks4/assess/publications.html>) to gain a full understanding of the protocols and procedures associated with this test. This manual contains general information about the test, step-by-step instructions for the test administration, and policies regarding absenteeism, lateness, violation of rules, etc.

If you encounter exceptional circumstances not addressed in this manual, or if you have further inquiries, contact Chantal Lambert, Administrative Officer, at 945-7620 or toll-free at 1 800 282-8069, extension 7620.

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General Information

Manitoba Education and Youth develops all standards tests in collaboration with teachers from across the province. This standards test is based on the *Senior 1 Mathematics: Manitoba Curriculum Framework of Outcomes and Senior 1 Standards (1997)* and *Senior 1 Mathematics: A Foundation for Implementation (1997)*.

The Senior 1 Mathematics Standards Test will be administered as an optional test at the discretion of the local jurisdiction. Once the decision is made to administer the test, schools are to follow the test administration procedures set out by the department.

The standards test is locally marked. Participating school divisions/districts and independent schools will determine the percentage of the mark on the standards test to be counted toward the student's final mark to a maximum of 25% of the student's final mark. Student results on the test will be released to students according to local policy on the date designated by local jurisdictions.

Marking instructions are provided by the department immediately following test administration. School principals will receive the *Marking Guides* for the Senior 1 Mathematics Standards Test by January 21, 2004. The *Marking Guides* are to be stored in a secure location until 12:00 noon on January 21, 2004.

Students are expected to write the standards test as scheduled near the end of the semester in which they take the course (e.g., January for first-semester courses, June for second-semester and full-year courses).

All schools should receive the test materials by January 12, 2004. Principals of public schools receive test materials from their division/district offices. Principals of independent and band-operated schools will receive test materials directly from the Assessment and Evaluation Branch.

The number of test booklets sent to each school is based on the October 17, 2003 registration information provided by the school. Please advise Chantal Lambert, Administrative Officer, at 945-7620 or toll-free at 1 800 282-8069, extension 7620, immediately if the number of students registered to write the test has increased since registration.

Manitoba Education and Youth supports local marking by:

- training representatives from local jurisdictions to act as local marking co-ordinators;
- collecting and scanning all *Answer/Scoring Sheets* from jurisdictions to provide them with test result summaries;
- centrally marking a random sample of locally-marked test booklets to provide feedback to jurisdictions on their local marking; and
- providing provincially-funded local jurisdictions with \$10.00 for each test administered in accordance with the test schedule noted on the following page and marked locally. The calculation is based on the number of students whose completed marking scan sheets have been received.

Features of the test

As a result of changes to the Senior 1 Mathematics curriculum which took effect in September 2001, the length and format of the standards test is as follows:

- the test will be administered in one session of **2 hours** with an additional 30 minutes if requested by the student and at the discretion of the classroom teacher; and
- the two curricular choices, Choice I and Choice II, **will be contained in the same test booklet.**

The remaining features of the test are unchanged:

- the test will contain both selected-response and constructed-response items;
- among the constructed-response items, the test will include "open-response" items which will be scored according to the Standards-Based General Scoring Rubrics (4-mark and 6-mark) found in Appendix A of the *Information Bulletin*; and
- English or French versions of the test will be available for students enrolled in Senior 1 Mathematics and "Mathématiques de secondaire 1".

Schools/classes choosing to cover all units from both choices are to have students select either Choice I or Choice II for testing purposes. The remaining unit is to be assessed locally.

Test schedule

The following table summarizes the schedule for the Senior 1 Mathematics Standards Test:

Date	Preparation Time	Time Required for Test
Wednesday, January 21, 2004	15 minutes preparation and instructions	2 hours + 30 minutes (optional)

The test must be written between 8:30 a.m. and 12:30 p.m. on Wednesday, January 21, 2004.

The total writing time for the session is 120 minutes plus 15 minutes for preparation and instructions. Additional writing time of 30 minutes is permissible if needed.

Policies for Standards Tests

Principals and supervising teachers should be aware that *Policies and Procedures for Standards Tests* handbook has been distributed to all schools and is also available on our website at: <http://www.edu.gov.mb.ca/ks4/assess/publications.html>. This handbook outlines current policies and procedures related to the administration of standards tests and reflects the principles and guidelines contained in *Principles for Fair Student Assessment Practices for Education in Canada* (1993).

Adaptations

Schools are asked to identify and submit requests for test adaptations **at the time of student registration**. These requests should be submitted on the *Request for Adaptations Form* included with the registration package. Following departmental review of the adaptation requests received, schools will be advised of the department's decision regarding these requests (see *Policies and Procedures for Standards Tests*, Sections 4.0, 4.1 and 4.2).

Exemptions

Decisions for student exemptions that fall within the guidelines set out in *Policies and Procedures for Standards Tests* (Sections 5.0, 5.1 and 5.2) are made at the school level and do not require departmental approval. Schools are required, however, to report school-based exemptions on the *Student Exemption Report* included with the registration package. If additional student exemptions are needed after the registration deadline date, an additional *Student Exemption Report* should be submitted as soon as possible.

For exemptions that fall outside the parameters of policy and procedure guidelines, requests should be made **at the time of student registration**. Please submit requests in writing to Wenda Dickens, Acting Director, Assessment and Evaluation Branch, 71-1567 Dublin Avenue, Winnipeg, Manitoba R3E 3J5.

Re-read provisions

As the reporting of individual student scores on locally marked standards tests is the responsibility of each local jurisdiction, the re-read policy for these tests is determined locally. Should a re-read be required for a test booklet that has been sent to the department as a part of the feedback on the marking process, the department will return a photocopy of the test booklet upon request. Please contact Chantal Lambert, Administrative Officer, at 945-7620 or toll-free at 1 800 282-8069, extension 7620.

Return of tests to students

Local jurisdictions decide whether to keep the test booklets or return them to students. The department will return the random sample of test booklets to schools within three months of marking.

Test confidentiality

Test materials must be kept secure and sealed until administration.

Test booklets must not be reproduced nor information from them communicated in any way until test administration is completed.

The *Marking Guides* are to be stored in a secure location until the test administration is complete.

Student materials

Students may use the following materials during the Senior 1 Mathematics Standards Test:

- scientific calculators;
- HB pencils;
- manipulative materials, such as algebra tiles, cubes and tracing paper;
- geometry sets;
- rulers; and
- erasers.

Students are not permitted to exchange materials during the test.

The following materials must **not** be used during the test:

- classroom notes, classroom textbooks, and other such materials;
- subject-related materials on display;
- dictionaries or translation resources of any kind; and
- graphing calculators.



Students leaving the room

Students are expected to remain in the room for a minimum of 60 minutes from the start of the test or the entire session.

However, any student who must leave and re-enter the room should be accompanied by a replacement supervisor. This practice ensures that the supervising teacher can remain in the test room with the students at all times.

Late arrivals

To avoid the opportunity for student discussion of test questions during the administration of the test, students may not enter the test room after the first hour of writing.

Students who arrive late, but within the first hour of the test, may be allowed additional time corresponding to the amount by which the student was late, at the discretion of the principal.

Student absences

Students who are absent for the Senior 1 Mathematics Standards Test will not be given another time to write the test. Schools have the responsibility to provide a final mark to absent students.

Responding to student questions

Avoid making any directing/guiding comments during the test, other than those required for distribution of materials and instructions to students.

No explanations, translations, rephrasing, clarifying statements or comments of a similar nature may be provided about the test content unless otherwise specified. Supervising teachers can, however, provide clarification regarding test taking rules or procedures.

If a student asks a question related to test content, a suggested response is, "I'm sorry. I can't answer your question. Do your best with it."

Suspected errors in printing or wording should not be communicated to students unless specific instructions are received from the Assessment and Evaluation Branch. You may however contact Ken Horton, Assessment Consultant, at 945-2576 or toll-free at 1 800 282-8069, extension 2576 to report any suspected errors.

Violation of rules

The *Test Taking Rules* are read aloud to students by the supervising teacher immediately before the test (see Appendix 1, page 17).

Document any violation of rules on the *Supervising Teacher Report*. This documentation should include:

- the test booklet number; and
- a description of the circumstances, including available evidence.

The student may be permitted to complete the test.

The consequences of any violation of rules is a local decision.

Damaged or misprinted materials

Students should be assured that they will not be penalized for any obvious error in printing or wording. Local marking co-ordinators will be advised of any known errors before the marking session. Return the unused damaged or misprinted booklet(s) with the reports and forms being sent to the department immediately after the test session.

On test administration date

If a damaged or misprinted test booklet is discovered **at the start** of the test session:

- replace the damaged or misprinted test booklet with a new test booklet; and
- print "DAMAGED" on the test booklet cover and on the *Attendance Form*.

During test administration

If a damaged or misprinted test booklet is discovered **during** the writing of the test:

- give the student a new test booklet (the student keeps the damaged or misprinted test booklet until the end of the session);
- instruct the student to continue responding to test items in the new test booklet;
- collect both test booklets at the end of the test session and ensure that both booklets are kept together by bundling with an elastic band;
- cross out the existing booklet number on the new test booklet and change it to the original booklet number so that **all student responses are recorded under the original booklet number**;
- indicate on the *Attendance Form* that two booklets have been used for one student (see Appendix 5, page 21); and
- record the damaged or misprinted test booklet number on the *Supervising Teacher Report*.

Responsibilities of School Principals

It is the responsibility of the principals to ensure that the tests are kept confidential until test administration is completed.

Other responsibilities are listed below.

If tests are not in your school by January 12, 2004:

- public school principals should contact their superintendent; and
- principals of independent and band-operated schools should contact Chantal Lambert, Administrative Officer, at 945-7620 or toll-free at 1 800 282-8069, extension 7620.

Use the *Packing List* to confirm that all materials have been received. Count the shrink-wrapped test booklets to ensure that there are enough booklets for the number of students writing the test. Keep the shrink-wrapped test packages unopened until the morning of the test. If additional test materials are needed, immediately contact Chantal Lambert, Administrative Officer.

Store test materials in a secure area in the school.

Provide supervising teachers with a listing of MET numbers for the students registered to write the test. Call the Professional Certification and Student Records Unit at 1 800 667-2378 to obtain MET numbers for new students.

Make arrangements to meet the requirements of the adaptations approved for your students (see Adaptations, page 3 and *Policies and Procedures for Standards Tests*, Sections 4.0, 4.1 and 4.2).

Co-ordinate test scheduling and space requirements.

Minimize the frequency of school announcements during the test session.

Ensure that a replacement supervisor is available to accompany students who must temporarily leave the room.

Provide the test materials to the supervising teacher on the morning of the test.

Complete the *Principal Feedback Form* before the end of the test session.

Advise the Assessment and Evaluation Branch of school closures or suspended school bus transportation services that occur on the test date as a result of unusual or extenuating circumstances or inclement weather conditions. Please contact Ken Horton, Assessment Consultant, at 945-2576 or toll-free at 1 800 282-8069, extension 2576.

Responsibilities of Supervising Teachers

Supervising teachers administer the test using the step-by-step procedures outlined in the following section.

(✓)	Advance preparations
	1. Check with your principal to ensure that:
	– appropriate scheduling and allocation of space for the test has occurred;
	– the test materials itemized on the <i>Packing List</i> have been inventoried;
	– a replacement supervisor is available to accompany students who must temporarily leave the room during the test;
	– arrangements have been made to accommodate the adaptations approved for students; and
	– a list of MET numbers for students writing the test is available.
	2. Ensure that all subject-related materials have been removed from the walls and boards.
	3. Notify students in advance of the:
	– time, location and duration of the test session;
	– materials needed to write the test;
	– <i>Test Taking Rules</i> (see Appendix 1, page 17);
	– list of <i>Directing Words</i> (see Appendix 2, page 18); and
	– minimum time a student must remain in the test room (60 minutes).
	4. Ensure that you have extra supplies and that there is a functioning pencil sharpener and stapler in the room. Students must not exchange materials during the test.
	5. If there is more than one teacher supervising the test, photocopy the <i>Supervising Teacher Report</i> .
	6. Review the sample forms in the Appendices.
	7. Please note that the pre-printed <i>Demographic Data Forms</i> already have the students' names and MET numbers and should be distributed accordingly.

(✓)	Prior to test session
	1. Ensure that you have access to the following test materials:
	– <i>Packing List</i> ;
	– <i>Student Response Booklets</i> ;
	– <i>Attendance Forms</i> (enclosed with shrink-wrapped test booklets);
	– extra copies of test booklets (four extras + teacher copy);
	– <i>Demographic Data Forms</i> (pre-printed and generic);
	– a list of MET numbers for students writing the test;
	– <i>Answer/Scoring Sheets</i> ;
	– <i>Supervising Teacher Report</i> ;
	– <i>Supervising Teacher Feedback Form</i> ;
	– <i>Principal Feedback Form</i> (this must be given to the principal and collected before returning materials);
	– <i>Administration Manual for Supervising Teachers</i> (this document); and
	– labelled envelope for return of materials to the Assessment and Evaluation Branch.
	2. Count the number of <i>Student Response Booklets</i> . The number of test booklets should equal the number requested by the school plus the additional 4 booklets. The number of booklets should also be identical to the number on the <i>Packing List</i> . If you need to split a bundle of booklets between classrooms, make a photocopy of the <i>Attendance Form</i> . Adjust each copy of the <i>Attendance Form</i> to reflect the booklets being used in each classroom.
	3. Arrange the desks so they are spaced as far apart as possible.
	4. Remove the following from the envelope labelled “For the Return of Demographic Data Forms”: – pre-printed <i>Demographic Data Forms</i> in alphabetical order for every student registered to write the test. Ensure that the school name, school code, and MET numbers appearing on the pre-printed forms are accurate (see Appendix 3, page 19); and – generic <i>Demographic Data Forms</i> for students who joined the classroom after registration, October 17, 2003, and who are scheduled to write the test (see Appendix 4, page 20). Note: Only one <i>Demographic Data Form</i> should be completed for each student. If a pre-printed <i>Demographic Data Form</i> exists for a student, that is the form that should be used. DO NOT complete a generic <i>Demographic Data Form</i> for that student.
	5. Sort the pre-printed <i>Demographic Data Forms</i> for distribution.
	6. Make arrangements per school policy to ensure that students who are exempted from writing the test are accommodated in an alternate setting.

(✓)	Beginning the test session
	1. Distribute:
	– <i>Student Response Booklets</i> ;
	– <i>Answer/Scoring Sheets</i> (double-sided); and
	– <i>Demographic Data Forms</i> .
	2. Tell students that while they are working you will:
	– be circulating the <i>Attendance Form</i> so they can print their names beside their test booklet number.
	3. Remind students to check that the booklet number on the <i>Answer/Scoring Sheet</i> corresponds with the number on the <i>Student Response Booklet</i> .
	4. Read aloud instructions for completing <i>Demographic Data Forms</i> . The instructions are found on the form itself. Direct students to print and shade in all the information requested. Remind students to accurately record the program (English, French Immersion, or Français) in which they are enrolled.
	5. Collect the <i>Demographic Data Forms</i> .
	6. Read aloud <i>Test Taking Rules</i> to students (Appendix 1, page 17).
	7. Read aloud <i>Points to Remember</i> to students (page iii in the test booklet).
	8. Remind students to:
	– pace themselves in writing the test;
	– use the <i>Answer/Scoring Sheet</i> for responding to selected-response questions; and
	– check over their work to ensure that all questions have been attempted.
	9. Tell students to complete common items and Choice I OR common items and Choice II. Direct them to use the appropriate side of the <i>Answer/Scoring Sheet</i> . Students must not make marks on the side they are not using as this affects the scannability of the form.
	10. Instruct students to turn the page and begin. Record the start time on the Supervising Teacher Report.
(✓)	During the test session
	1. Supervise the completion of the <i>Attendance Form</i> by ensuring that students print their name beside their test booklet number. Ensure that each student has recorded the correct test booklet number by verifying that the test booklet number corresponds with the student name recorded on the <i>Attendance Form</i> (see sample <i>Attendance Form</i> , Appendix 5, page 21). Note: This is the only record connecting students' identities to their <i>Student Response Booklet</i> .

	2. Verify that all the information on each <i>Demographic Data Form</i> is accurately printed and shaded. – If the new information provided on the pre-printed <i>Demographic Data Form</i> is inaccurate, correct it. – If the information on the generic <i>Demographic Data Form</i> is inaccurate, erase the error and record the correct information. Place all used forms in numerical order followed by any unused forms in the labelled envelope provided. Do not use elastic bands, staples or paper clips on these forms as they may damage the sheets. Do not seal the envelope.
	3. Half-way through the test session, advise students of the amount of time remaining by writing it on the board.
(✓)	Ending the test session
	1. Have students place their <i>Answer/Scoring Sheet</i> inside the front cover of the test booklet. Collect test booklets from each student.
	2. As students submit their test materials, ensure that each test booklet number matches the information on the <i>Answer/Scoring Sheet</i>, the <i>Attendance Form</i> and the <i>Demographic Data Form</i> (e.g., cross-reference student name and test booklet number). Each student must have the same booklet number on all test materials.
	3. Place a check “✓” on the <i>Attendance Form</i> in the “Booklet Submitted to Local Marking Co-ordinator for Marking” column, indicating either Choice I or Choice II for students who wrote the test.
	4. Record the time students finish writing the test on the <i>Supervising Teacher Report</i>. Do not include extra time given for late arrivals or adaptations.
	5. Stack the test booklets in numerical order.
	6. If marking is conducted in the classroom or at the school, leave the <i>Answer/Scoring Sheets</i> inside the front cover of each booklet. After marking, place all used <i>Answer/Scoring Sheets</i> in numerical order followed by any unused forms. Place the forms in the labelled envelope. Do not seal the envelope. If marking is conducted in a central location, place all used <i>Answer/Scoring Sheets</i> in numerical order followed by any unused forms. Place the forms in the labelled envelope. Do not seal the envelope.
	7. Complete the <i>Supervising Teacher Report</i>. Note any unusual circumstances on this report.
	8. Ensure that the number of check marks in the “Booklet Submitted to Local Marking Co-ordinator for Marking” column on the <i>Attendance Forms</i> matches your count of the booklets and <i>Answer/Scoring Sheets</i> for submission.
	9. Make two copies of the <i>Attendance Forms</i> and <i>Supervising Teacher Report</i>. One copy must be retained by the school and one forwarded to the local marking site, if a centralized marking model is used.
	10. Collect the <i>Principal Feedback Form</i>.
	11. Complete the <i>Supervising Teacher Feedback Form</i>.

	12. Return all test booklets and other test-related materials to the secure area in the school until commencement of marking or until materials are to be forwarded to the local marking site.
	13. Send materials according to the instructions on the following pages.

Points to Remember

- Remain in the classroom throughout the entire test session and engage in work solely related to the duties of supervising the test.
- A replacement supervisor must be available to assist you.
- Store all documents not in use in a secure area in the school.
- Ensure that once a booklet number has been assigned to a student, all materials distributed to that student have the same booklet number.
- Students may **not** bring anything produced outside of class into the test session.

Submitting Materials on January 21, 2004 (the end of the test)

It is essential that the following materials are packaged and forwarded to the local marking site immediately after completion of the test if a centralized model is used.

- All used *Student Response Booklets*;
- All used *Answer/Scoring Sheets*;
- Copy of the *Attendance Forms*; and
- Copy of the *Supervising Teacher Report*.

All other documentation should be verified and returned to the Assessment and Evaluation Branch after the test session.

- *Attendance Forms*;
- All used *Demographic Data Forms* (in envelope provided);
- *Supervising Teacher Report*;
- *Supervising Teacher Feedback Form*;
- *Principal Feedback Form*; and
- All damaged or misprinted booklets.

Schools in the City of Winnipeg return their envelopes to the Assessment and Evaluation Branch by calling Mid-Canada Courier (989-5630) and arranging pick-up between **1:00 p.m. and 4:00 p.m. on January 21, 2004**. The person placing the call should quote **account number E901**, provide the school name, address and the name of the contact person.

Schools outside the City of Winnipeg return their envelopes to the Assessment and Evaluation Branch by using the Xpresspost Flexipack envelope provided and taking it to the post office.

Submitting Materials After Local Marking

(to be received by the Assessment and Evaluation Branch no later than January 30, 2004)

When local marking is done at a central location, the **local marking co-ordinator** is responsible for sending the materials to the Assessment and Evaluation Branch. When local marking is done at the classroom level, the **teacher** is responsible for sending the materials to the Assessment and Evaluation Branch.

After local marking has been completed, prepare a package to be received by the Assessment and Evaluation Branch no later than January 30, 2004. This will ensure there is sufficient time for processing prior to semester end.

The package must include:

- *All Answer/Scoring Sheets;*
- *Student Response Booklets* requested by the department for feedback on the marking process;
- *Sample Request List;* and
- *Local Marking Co-ordinator Feedback Form.*

Jurisdictions within the City of Winnipeg send packages directly to the Assessment and Evaluation Branch via **Mid-Canada Courier (989-5630)**. The person placing the call should quote **account number E901**, give the jurisdiction name, address, and the name of the contact person.

Jurisdictions outside the City of Winnipeg return their package by Xpresspost. It is important to package all materials in the **Xpresspost Flexipack envelope** provided whenever possible.

After the package is sealed, deliver it to the local post office.

We have provided sufficient materials for the return of **one** envelope/package. If you must send a second envelope/package, photocopy the mailing address label and affix the copy to the second package. Note you must use a photocopy of the mailing address label as it provides Canada Post with billing information. Ask the postal clerk for an additional bar code label to attach to the second envelope/package. Ensure that the school representative retains the bar code number in case tracing the package is required.

Return **all Answer/Scoring Sheets**. We remind you that payments will be made according to the number of completed marking sheets received.

Appendices

Appendix 1: Test Taking Rules

Senior 1 Mathematics Standards Test

The supervising teacher is expected to read these rules aloud to students at the beginning of the Senior 1 Mathematics Standards Test:

- Check the title of your test booklet carefully. Make sure that the number on your test booklet matches the number on your *Answer/Scoring Sheet*.
- During this test session, do not proceed until instructed to do so.
- If you receive a damaged or misprinted booklet, raise your hand and I will give you a new one.
- You are expected to remain in the test room for **one hour**. (You may leave before that time in exceptional circumstances such as illness, when accompanied by a supervisor.)
- At the beginning of the session you should only have a scientific calculator, an HB pencil, a geometry set, a ruler and an eraser. You may also have manipulative materials. No other materials are permitted. Do not exchange test materials.
- You will not give assistance to, nor receive assistance from another student. If you require something during the test, raise your hand and I will come to you.
- During the test I can help you with the directions, but I will not be able to help you with the test questions.
- Do **not** identify yourself, your school, teacher or town in your test booklet.
- When I ask you to stop writing, put your pencil down immediately.
- You may not discard any materials. The test booklet must remain intact except for the tear-out "Formulas" page numbered *ii*. Any extra paper used must be stapled into the test booklet on the appropriate page. You may **not** leave the room with any materials pertaining to the test.
- Use the appropriate side of the *Answer/Scoring Sheet* corresponding either to Choice I or to Choice II as I have indicated to you. Do not put any marks on the side you are **not** using as this affects the scannability of the form.

Appendix 2: Directing Words

Senior 1 Mathematics Standards Test

Students should be prepared to answer questions containing the following directing words:

The word	The question is asking for...
create	an idea or object that you have made up
justify/support/verify	an explanation, information or evidence that shows why your method, idea or answer is good
explain	words or symbols, diagrams, charts or graphs, or other methods that make clear what you mean or what you are thinking
illustrate/sketch	a reasonably neat picture or diagram (not necessarily to scale) that shows or explains an idea or method
model	a sketch that shows an idea; a type of explanation
assumption	anything or any condition that is not given in the question but that you have supposed or invented to find the answer to the problem
generalization	a general idea, statement, rule or principle that relates an answer or conclusion to other similar situations

SENIOR 1 MATHEMATICS STANDARDS TEST – JANUARY 2004 /
TEST BASÉ SUR LES NORMES MATHÉMATIQUES DE SECONDAIRE 1 – JANVIER 2004

Program/
Programme **ENGLISH**

Birth Date/
Date de naissance 01/01/01

Provincial Student Number/
Numéro provincial de l'élève 999-999-999Booklet No./
N° de cahier

1. Write and shade in the Booklet No.
2. Use an HB pencil only. Do not use ink, ball point, or felt tip pens.
3. Erase cleanly any marks you wish to change.
4. Do not mark other areas on this form.
5. If the pre-printed information is inaccurate, please cross it out and write in the correct information.

C	D	E	F	G
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

1. Inscrire votre **N° de cahier** et noircir les cercles qui y correspondent.
2. Utiliser seulement un crayon HB.
Ne pas utiliser de stylo à encre ou à bille, ni de crayon feutre.
3. Bien effacer toute marque que vous désirez changer.
4. Ne pas faire de marques à d'autres endroits sur ce formulaire.
5. Si les renseignements pré-imprimés sont inexacts, les rayer et écrire les renseignements exacts.

Appendix 4: Sample Generic Demographic Data Form

[illegible]

Appendix 5: Sample Attendance Form

School Number: 9999
Somewhere School
Somewhere Address
Somewhere MB R0R 0R0

Page _____ of _____

ATTENDANCE FORM—JANUARY 2004

SENIOR 1 MATHEMATICS STANDARDS TEST

Booklet Number	Student Name (please print)	Booklet Submitted to Local Marking Co-ordinator for Marking (check ✓ one only)	
		Choice I	Choice II

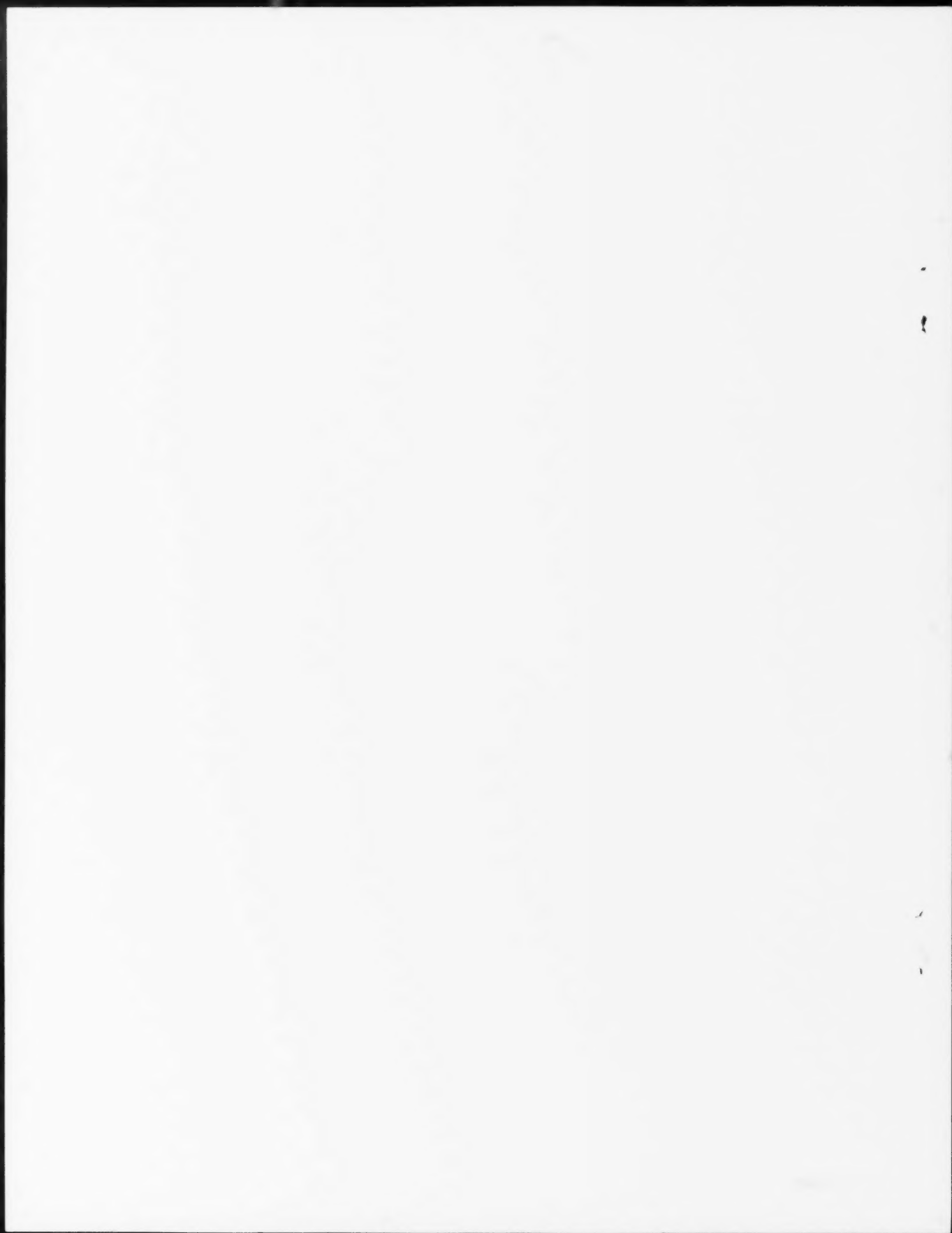
30001	Karen Masi	✓	
30002	Walter Woronowski	✓	
30003	Michael Smith	✓	
30004	DAMAGED		
30005	Jason Chu	✓	
30006	Shelley Bracken	✓	
30007	Bonnie Walters	✓	
30008	Used with 30006 (damaged)		
30009	UNUSED		
30010	UNUSED		

Note: Record a "✓" for each booklet submitted for marking.

Mr. John Ormiston

Supervising Teacher's Name (please print) _____

Please retain a copy of this form for your records. You will need a copy of this form to link your locally marked test with a student's name.



SENIOR 1 MATHEMATICS STANDARDS TEST

Student Response Booklet Choice I and Choice II

January 2004

10540

Bundle No.

Choice I ☒

Choice II ☐

Marker 1

TABLE NO.

MARKER ID NO.

Marker 2

TABLE NO.

MARKER ID NO.

Marker 3

TABLE NO.

MARKER ID NO.

SENIOR 1 MATHEMATICS STANDARDS TEST

GENERAL DIRECTIONS FOR COMPLETING THE PRE-PRINTED DEMOGRAPHIC DATA FORM

- Please check the following information on the *Demographic Data Form*. It is important that this information is both accurate and complete. If the information is not accurate, cross it out and write the correct information.

1. NAME (Last and First)
2. PROGRAM INFORMATION
3. BIRTH DATE

- Please provide the following information on the *Demographic Data Form*:

BOOKLET NO.: This is the five-digit number on the front of your test booklet. Write in your booklet number and fill in the appropriate circle below each number.

GENERAL DIRECTIONS FOR COMPLETING THE GENERIC DEMOGRAPHIC DATA FORM

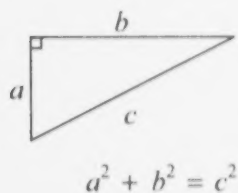
- If a pre-printed form is not available for you, provide the following information on the generic *Demographic Data Form*. It is important that this information is both accurate and complete.

1. NAME (Last and First): Print your last and first names in the spaces provided and fill in the corresponding circle below each letter.
2. PROGRAM INFORMATION: Fill in the circle that corresponds to the program in which you are currently registered.
3. PROVINCIAL STUDENT (MET) NO.: This is your provincial identification number which is available from your teacher.
4. BIRTH DATE: Fill in the appropriate circles and write in the appropriate numbers.
5. BOOKLET NO.: This is the five-digit number on the front of your test booklet. Write in your booklet number and fill in the appropriate circle below each number.
6. SCHOOL CODE: You will be provided with this four-digit number. Write in your school code and fill in the appropriate circle below each number.

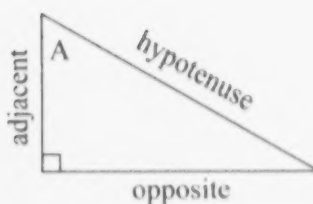
SENIOR 1 MATHEMATICS

FORMULAS

Pythagorean Theorem



Trigonometric Ratios

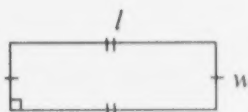


$$\sin A = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\cos A = \frac{\text{adjacent}}{\text{hypotenuse}}$$

$$\tan A = \frac{\text{opposite}}{\text{adjacent}}$$

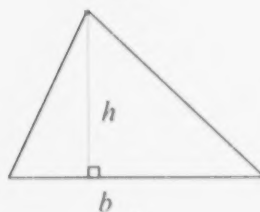
rectangle



$$A = lw$$

$$P = 2l + 2w$$

triangle



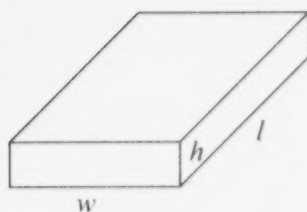
$$A = \frac{bh}{2}$$

circle



$$A = \pi r^2$$

$$C = 2\pi r \quad C = \pi d$$



$$\text{Volume} = lwh$$

Surface Area = Total area of all faces of a 3-D object.

SENIOR 1 MATHEMATICS STANDARDS TEST

POINTS TO REMEMBER

Formulas are given on the tear-out **"Formulas"** page on the other side of this page or with the question when needed. Please do not tear out any pages other than the **"Formulas"** page.

Diagrams are not drawn to scale unless indicated otherwise.

The total time allowed for writing the test is 150 minutes (120 minutes plus 30 minutes extra time which your teacher may allow if you need it).

- Do not write your name on the test booklet.
- Work alone on this test.
- You may use a scientific calculator. All other electronic aids are not allowed.
- You may use models or other manipulative materials, including tracing paper.
- Notes, notebooks or textbooks may not be used during the test.
- You may use blank scrap paper but it must be handed in at the end of the test. You may do rough work anywhere in this booklet.
- Be sure you have attempted each question in both parts of the test including the questions for Choice I **OR** Choice II in both parts. Your teacher will tell you which Choice (I or II) to do.
- Be sure you use the correct side of the *Answer/Scoring Sheet* corresponding to the Choice (I or II) you are doing.

If you need more space to answer a question, you may use an extra page provided by your teacher. Write your Booklet ID number and question number on any extra page(s) used. Staple the page(s) into your booklet where your answer begins.

DESCRIPTION—COMMON ITEMS AND CHOICE I (Spatial Geometry)

Total possible marks: 68

Time: 120 minutes

This test consists of 2 parts:

Part	Description	Suggested Time (minutes)	Marks
A	<i>Selected-response questions: worth one mark each.</i>	40	25
B	<i>Constructed-response questions: mark value is indicated for each question.</i>	80	43

DESCRIPTION—COMMON ITEMS AND CHOICE II (Transformational Geometry)

Total possible marks: 68

Time: 120 minutes

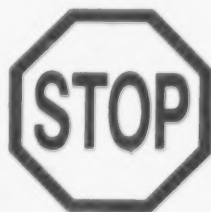
This test consists of 2 parts:

Part	Description	Suggested Time (minutes)	Marks
A	<i>Selected-response questions: worth one mark each.</i>	40	25
B	<i>Constructed-response questions: mark value is indicated for each question.</i>	80	43

DIRECTIONS FOR PART A: SELECTED-RESPONSE QUESTIONS

(Suggested Time: 40 minutes)

- Read each question carefully.
- Choose the best response and mark it on the *Answer/Scoring Sheet*. Be sure to use the correct side of the *Answer/Scoring Sheet* (Choice I or Choice II) as directed by your teacher.
- Each question should take no more than about two minutes to answer. If a question is taking too long to answer, come back to it later.



PLEASE WAIT UNTIL THE TEACHER TELLS YOU TO TURN THE PAGE.

PART A

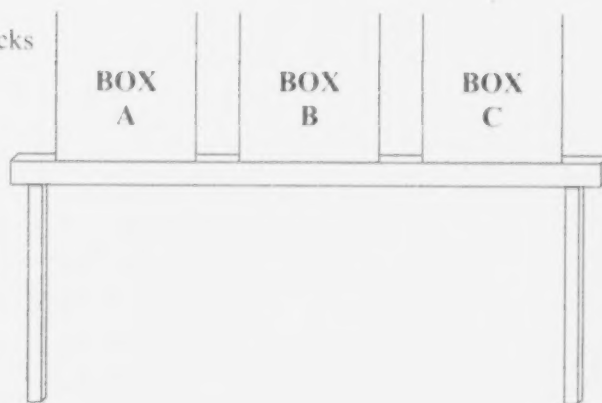
SELECTED-RESPONSE QUESTIONS

1. What is the next number in the following pattern?

$$\frac{1}{2}, 2, 5, 11, 23, \underline{\hspace{2cm}}$$

- A) 34 B) 46 C) 47 D) 71

2. There are three boxes on a table.
One contains green blocks, one contains red blocks
and one contains both green and red blocks.
Without looking, you reach into Box A and
pull out a red block.



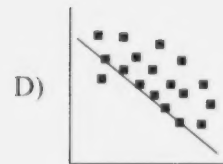
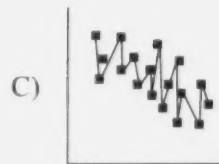
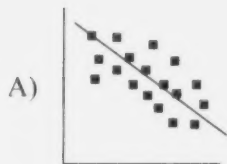
Which statement is **FALSE**?

- A) Box A may contain green blocks.
B) Box B must contain green blocks.
C) Box B or C must contain red blocks.
D) Box C may contain red blocks.
3. What is the number of line segments needed to connect each dot to all other dots?



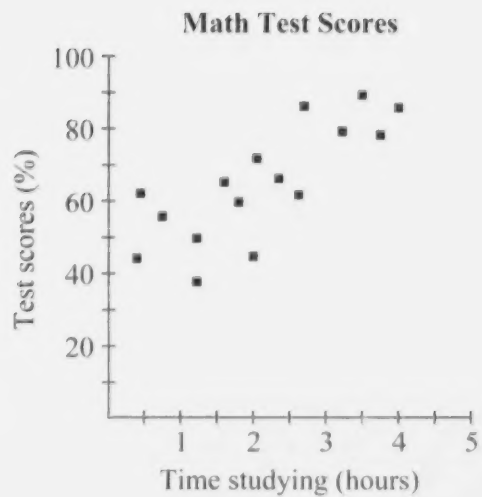
- A) 5 B) 7 C) 10 D) 20

4. Which scatterplot has the line of best fit?

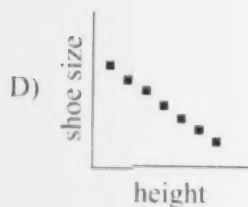
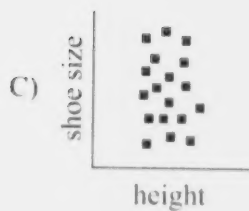
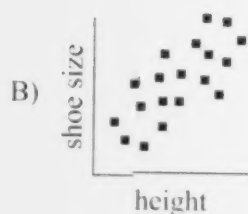
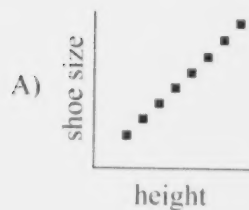


5. Using this scatterplot, predict the math test score of a student who studied for 2 hours.

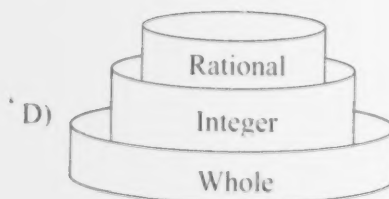
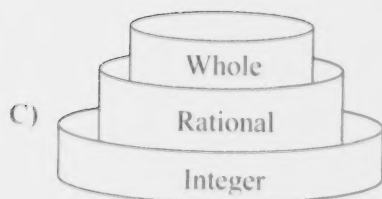
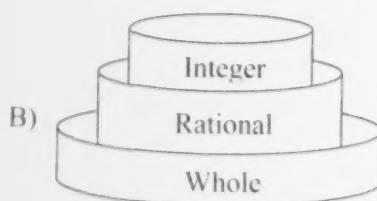
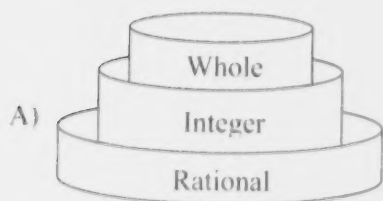
- A) 80%
B) 70%
C) 60%
D) 50%



6. Select the scatterplot which **best** represents the relationship between height of people and their shoe size.



7. Which diagram correctly shows how the sets of numbers relate to each other?



8. $-(x - 3)$ equals

A) $3 - x$

B) $3 + x$

C) $x - 3$

D) $-x - 3$

9. If $x + 4 = 3x$, then $3x + 12 =$

A) $6x$

B) $9x$

C) $3x + 4$

D) $9x + 12$

10. Solve: $2(x - 3) = x + 6$

A) $x = 0$

B) $x = 4$

C) $x = 9$

D) $x = 12$

11. What is the probability of getting two even numbers when you roll two number cubes that are both numbered 1 to 6?



A) $\frac{1}{36}$

B) $\frac{1}{4}$

C) $\frac{1}{2}$

D) 1

12. If the expression 2^3 represents the volume of a cube with edges of length 2, then 3^2 represents

- A) the volume of a cube with edges of length 2.
- B) the area of a square with sides of length 2.
- C) the volume of a cube with edges of length 3.
- D) the area of a square with sides of length 3.

13. Simplify $\frac{8x^4}{2x}$

- A) $4x^3$
- B) $6x^3$
- C) $6x^4$
- D) $4x^4$

14. Simplify $\frac{12y^5 - 6y^2}{2y^2}$

- A) $6y^3 - 6y^2$
- B) $3y$
- C) $6y^3 - 3$
- D) $6y^3 - 3y$

15. What is the **product** of $3x$ and $8xy^2$?

- A) $11x^2y^2$
- B) $24xy^2$
- C) $24x^2y^2$
- D) $11xy^2$

16. Evaluate $(x + y)(2x^2 - 3y)$ if $x = -1$ and $y = 4$.

A) -48

B) -42

C) -30

D) -24

17. A culture of 20 000 bacteria doubles every hour. At the end of the 5th hour, the total number of bacteria will be

A) $20\,000 \times 5$

B) $(20\,000)^5$

C) $20\,000 \times 5^2$

D) $20\,000 \times 2^5$

18. A spider has a mass of approximately 0.045 grams.
What is the mass in grams of 2500 spiders?

A) 1.125×10^{-3}

B) 1.125×10^2

C) 11.25×10^2

D) 1.125×10^3

19. Evaluate $\frac{3.8 \times 10^{15}}{4.8 \times 10^6}$

A) 7.9×10^8

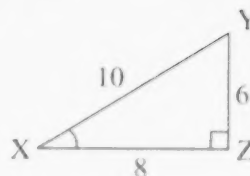
B) 7.9×10^9

C) 7.9×10^{20}

D) 7.9×10^{21}

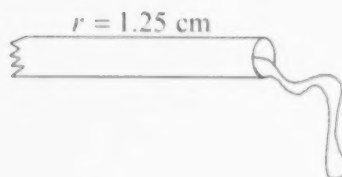
20. In reference to $\angle X$, the measures for the sides of $\triangle XYZ$ are

	adjacent	hypotenuse	opposite
A)	6	8	10
B)	6	10	8
C)	8	6	10
D)	8	10	6



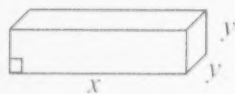
21. The speed (cm/min) of water flowing through a pipe is given by the formula $speed = \frac{Vol}{\pi r^2}$. In this formula, Vol is the rate of flow of water coming out of the pipe (cm^3/min) and r is the radius of the pipe. Given the information in the diagram, calculate the speed of the water in the pipe?

- A) 6.5 cm/minute
B) 12.7 cm/minute
C) 20.4 cm/minute
D) 25.5 cm/minute



$$Vol = 100 \text{ cm}^3/\text{minute}$$

22. Choose the simplified expression for the total surface area of the prism shown below.



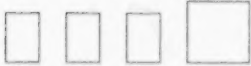
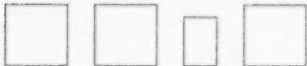
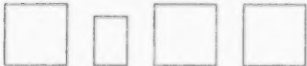
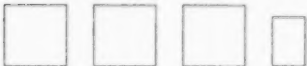
- A) $4x^2 + 4y^2$ B) $2xy + y^2$ C) $4xy + 2y^2$ D) $2x^2 + 2xy + 2y^2$

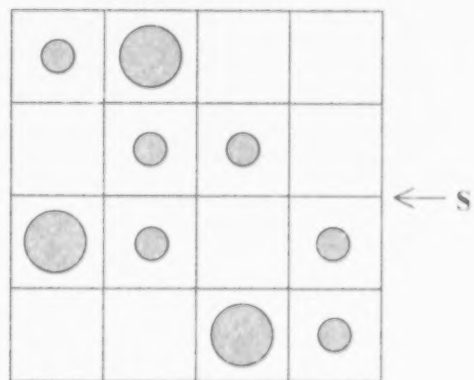
Complete Choice I on pages 9–11
OR Choice II on pages 13–14.

CHOICE I: SPATIAL GEOMETRY

23. Large cylinders  and small cylinders  are placed on a board as shown below.

What is the view from side S?

- A) 
- B) 
- C) 
- D) 

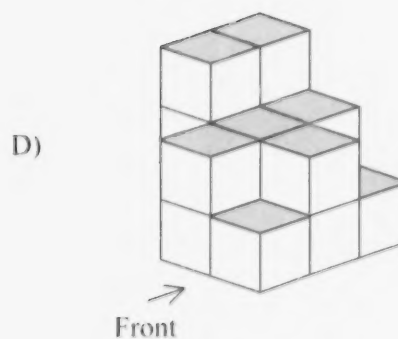
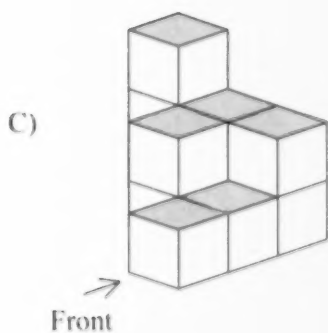
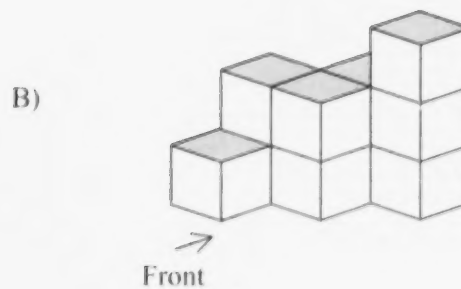
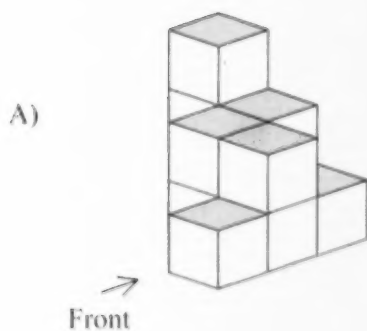


24. Select the object with the following base plan.

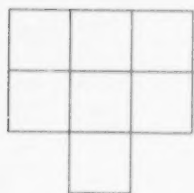
Base Plan

3	2	1
	2	2
		1

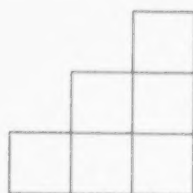

Front



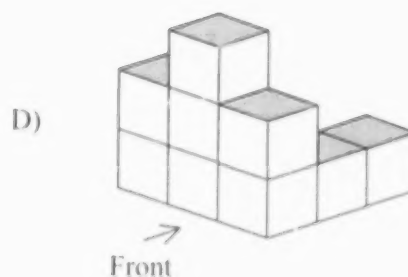
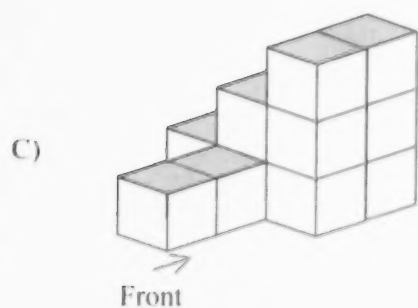
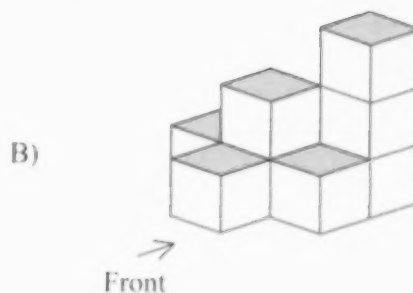
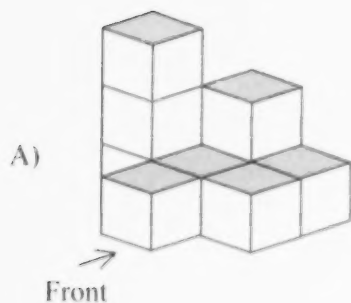
25. Which object could have the following views?



Top view



Front view



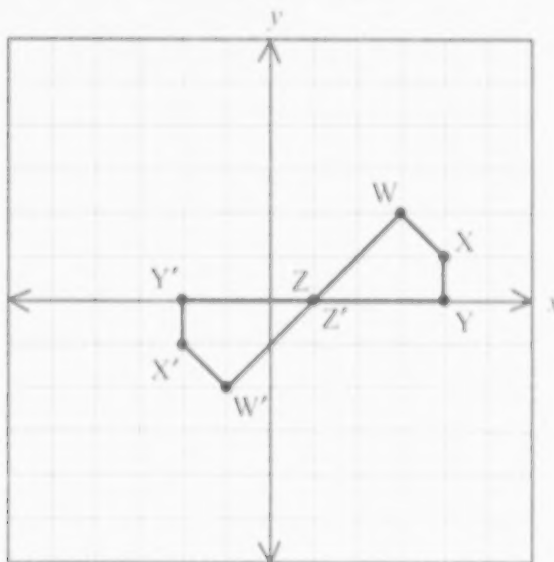
End of Choice I Selected-Response Questions.

Now go to Part B: Constructed-Response Questions on page 15.

CHOICE II: TRANSFORMATIONAL GEOMETRY

23. What is the transformation that results in the creation of the image $W'X'Y'Z'$ from $WXYZ$?

- A) reflection in the x -axis
- B) reflection in the vertical line passing through $(1, 0)$
- C) rotation of 90° clockwise about Z
- D) rotation of 180° clockwise about Z



24. A shape is drawn on graph paper. The image is created by reflecting the shape in the x -axis, followed by a translation of $(x + 2, y - 3)$.

Which statement is **TRUE**?

- A) The image is congruent to the shape.
- B) The image is a reduction of the shape.
- C) The image is an enlargement of the shape.
- D) The image and shape must overlap.

25. It can be shown that a shape and its dilated image are similar because:

- A) their areas are equal
- B) their perimeters are equal
- C) corresponding sides are proportionate
- D) corresponding angles are different

End of Choice II Selected-Response Questions.

Now go to Part B: Constructed-Response Questions on page 15.

DIRECTIONS FOR PART B: CONSTRUCTED-RESPONSE QUESTIONS

(Suggested Time: 80 minutes)

Write your answers in the space provided with each question. If you need more space to answer a question, you may use an extra page provided by your teacher. Write your Booklet ID number and question number on any extra page(s) used. Staple the page(s) into your booklet where your answer begins.

Directing Words

Some questions may include directing words such as *explain*, *justify* and *create*. These words are explained below.

The word	The question is asking for...
create	an idea or object that you have made up
justify/support/verify	an explanation, information or evidence that shows why your method, idea or answer is good
explain	words or symbols, diagrams, charts or graphs, or other methods that make clear what you mean or what you are thinking
illustrate/sketch	a reasonably neat picture or diagram (not necessarily to scale) that shows or explains an idea or method
model	a sketch that shows an idea; a type of explanation
assumption	anything or any condition that is not given in the question but that you have supposed or invented to find the answer to the problem
generalization	a general idea, statement, rule or principle that relates an answer or conclusion to other similar situations

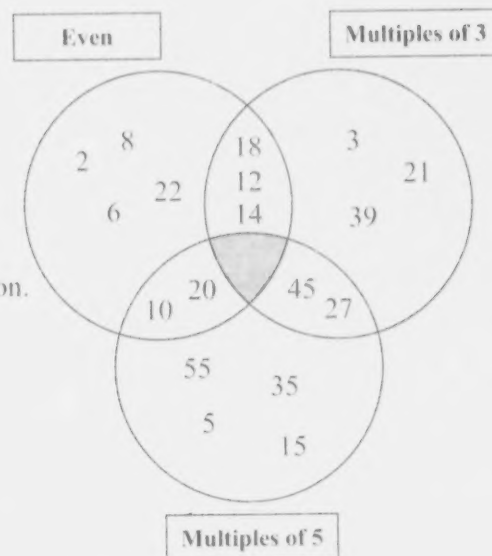
Suggestions for answering OPEN-RESPONSE QUESTIONS:

- provide **complete answers**;
- let the mark values for each question guide you in answering it;
- provide good explanations and justifications; and
- use a systematic and well-organized method in communicating the answer.

PART B
CONSTRUCTED-RESPONSE QUESTIONS

26. **OPEN-RESPONSE QUESTION**

Dan draws and fills in a diagram using **whole numbers**.



- a) Write a number that belongs in the shaded region.
- b) Dan placed some numbers incorrectly while filling in his diagram.
- Explain one of his errors.
- c) • State one number (not zero) that does not fit in any of the circles.
• Explain your reasoning.

4 marks

27. The students in your school voted to elect a president for the student council.

- Was this election the result of a sampling or the result of a census?
- Explain your reasoning.

102

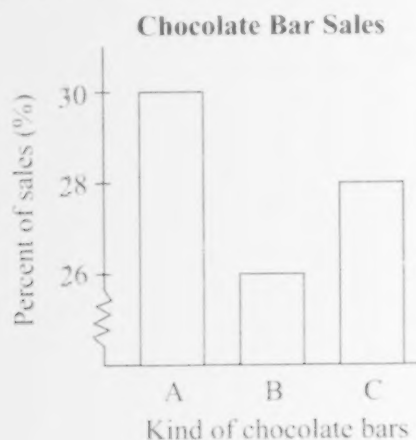
2 marks

28. A chocolate bar company compares its sales of three kinds of chocolate bars in some parts of Manitoba.

103

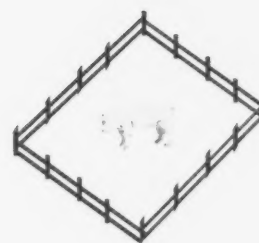
a) How could this data have been collected to avoid bias?

b) The company claims that bar A is **much more** popular than bar B.
Using the graph, explain whether or not the company's conclusion is reasonable.



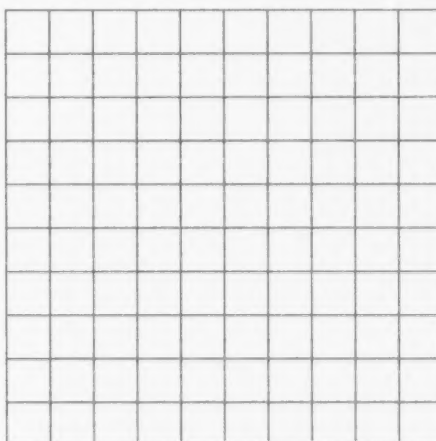
2 marks

29. The following data were collected by a researcher studying the relationship between the growth rate of pigs and the size of the pigs' enclosures.



Size of enclosure (m^2)	2	7	3	3	5	6	10	3
Growth rate (kg/week)	1.5	1.0	1.0	1.5	0.8	0.5	1.0	1.2

- a) Create the scatterplot for the data above.
- Label your scatterplot.



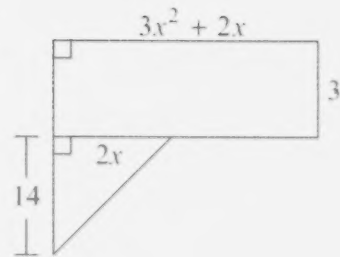
- b) What is the independent variable on your scatterplot?

3 marks

30. a) Write the algebraic expression for the area of the rectangle.

b) Write the algebraic expression for the area of the triangle.

c) Write the **simplified** algebraic expression for the total area of the figure.



3 marks

31. **OPEN-RESPONSE QUESTION**

a) Create the dimensions of two different rectangles that each have an area of $12xy$.

Rectangle 1

Rectangle 2

- b) • Using one of your rectangles, state one or more values that are impossible for x or y .
• Explain your reasoning.

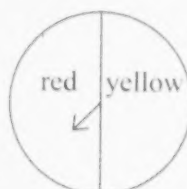
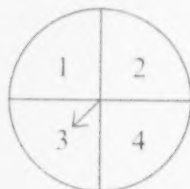
4 marks

$$X = -1$$

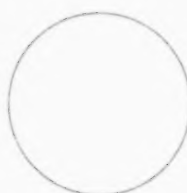
- 3 marks

33. OPEN-RESPONSE QUESTION

- a) What is the probability of getting 3 and *red* when the spinners are each spun once?



- b) • Design two different spinners that, when both are spun, can result in a probability of $\frac{1}{24}$.



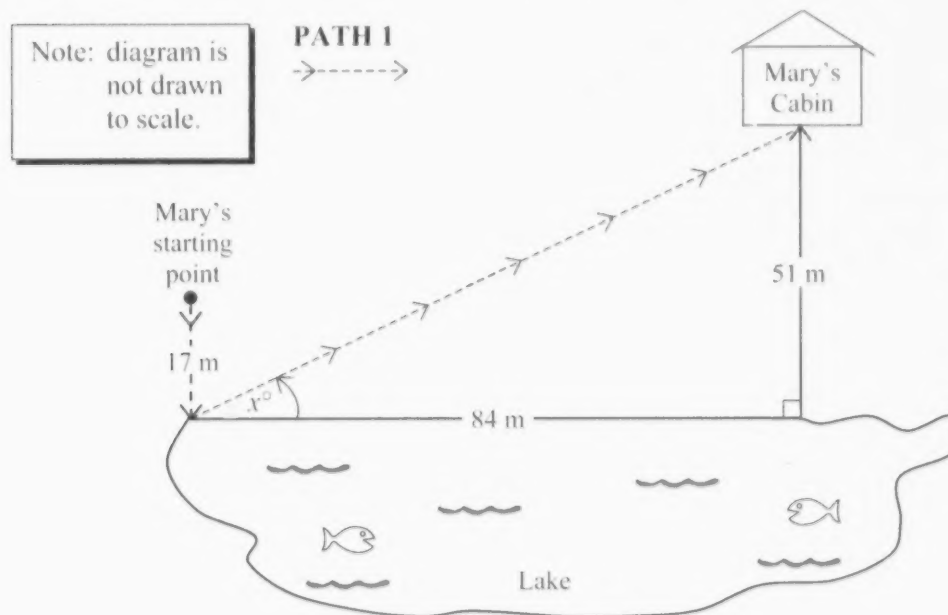
- Using your two spinners, justify how a probability of $\frac{1}{24}$ is obtained.

- c) Describe the difference between theoretical probability and experimental probability.

4 marks

34. OPEN-RESPONSE QUESTION

Mary plays soccer every day near the lake. Afterwards, she has to get water from the lake and carry it to the cabin. To save time, she walks in a straight line to the lake, gets some water, and goes directly to the cabin.



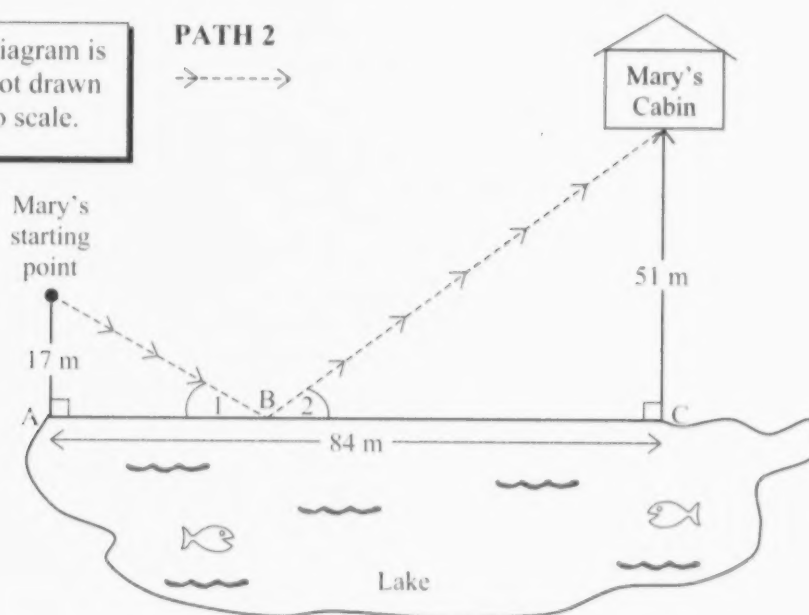
a) Calculate the **total** distance Mary travels on Path 1 from her starting point to her cabin.

- b) • Calculate the measure of angle x .
• Show your work.

The next day, after playing soccer, Mary chooses a different path to get water and return to the cabin.

Note: diagram is
not drawn
to scale.

PATH 2



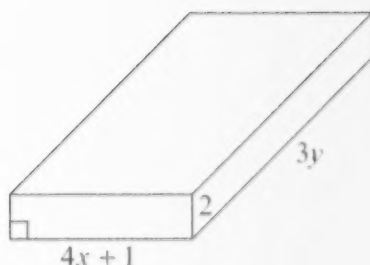
- c) • Create and label an appropriate measure for one angle ($\angle 1$ or $\angle 2$).
- Use your angle measure to calculate the total distance Mary travels on Path 2.
 - Show your work.

6 marks

35. Which is greater, $(-7)^2$ or -7^2 ?
Explain your reasoning.

2 marks

36.

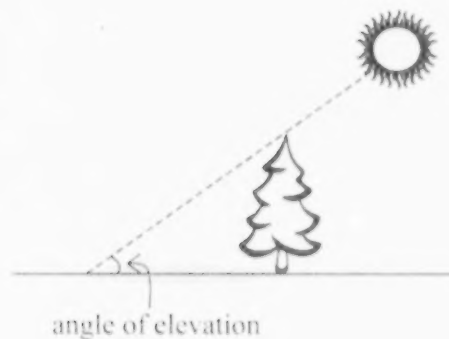


- a) Write the **simplified** algebraic expression for the **volume** of this rectangular prism.
- b) If $x = 2$, substitute this value into your expression in a) and **simplify** it.
- c) The volume of this prism is 270 cm^3 . Knowing that $x = 2$, what is the value of y ?

3 marks

37. A tree casts a shadow 20 metres long.

- If the tree is 10 metres high, calculate the angle of elevation to the sun using trigonometry.
- Label the diagram and show your work.



2 marks

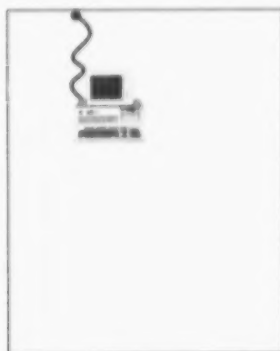
**Complete Choice I on pages 27–28
OR Choice II on pages 29–30.**

CHOICE I: SPATIAL GEOMETRY

38. In a room that measures 8 m by 10 m, Lucas' computer is plugged into the wall 2 metres from the corner, as shown below. This is the only outlet in the room.

113

Scale:
1 cm = 2 m



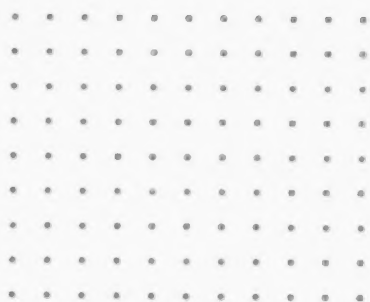
- a) The cord is 4 m long and remains plugged in as shown. **Accurately** draw and shade the locus of points **inside** the room where Lucas can place his computer.
- b) State one assumption you made to draw your locus of points.

3 marks

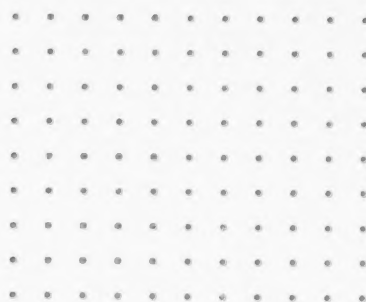
39. The base plan of a 3-D model is shown.
Draw the front and right elevations.

3	1	2
2	2	2
1	1	1

Front



front elevation



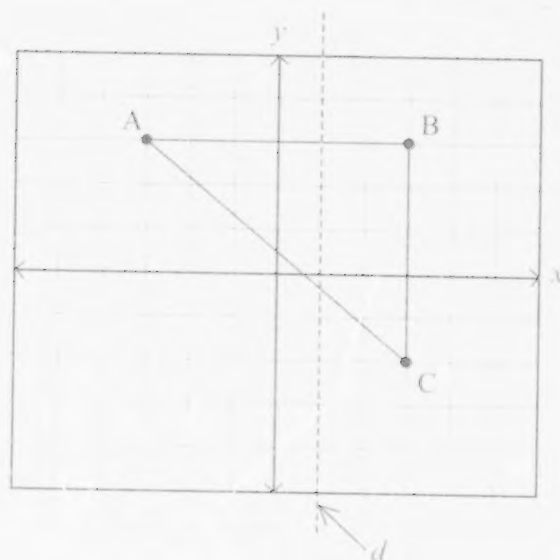
right elevation

2 marks

END OF TEST—CHOICE 1

CHOICE II: TRANSFORMATIONAL GEOMETRY

38. a) Draw and label the image of $\triangle ABC$ after the reflection in line "d".

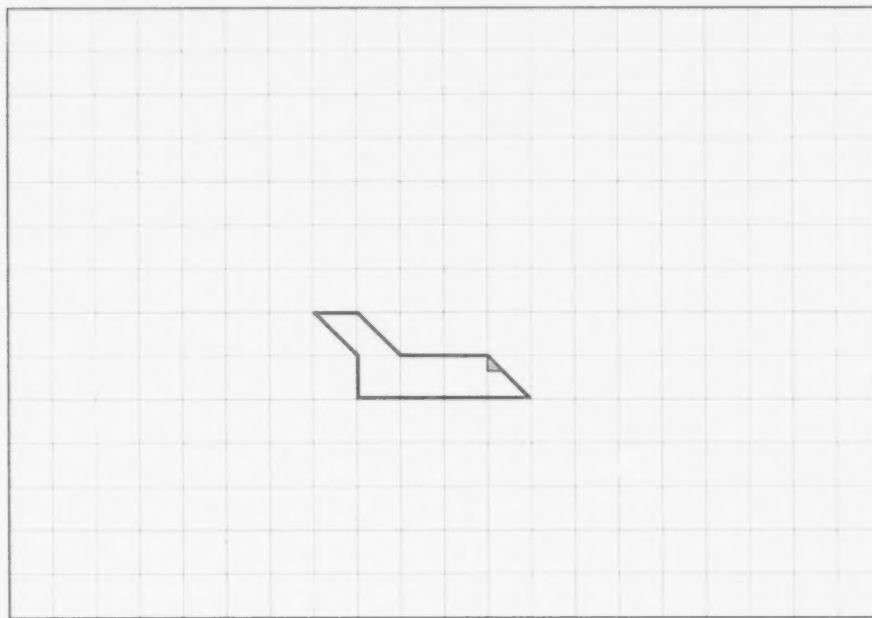


- b) Give the coordinates of A' .

$A'(\underline{\hspace{1cm}}, \underline{\hspace{1cm}})$

2 marks

39. a) Draw the image of the figure shown by enlarging it by a scale factor of 3.



- b) What type of transformation is this enlargement called?
- c) Briefly explain how you did the transformation.

3 marks

END OF TEST—CHOICE II

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Manitoba Education, Citizenship and Youth,
Assessment and Evaluation Branch,
Winnipeg, Manitoba R3E 3J5

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SENIOR 1 MATHEMATICS STANDARDS TEST

Marking Guide Choice I and Choice II

January 2004

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Manitoba Education, Citizenship and Youth,
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General Marking Instructions

Please make no marks in the *Student Response Booklets*.

Please ensure that:

- each student's final result is recorded, by test booklet number, on the corresponding *Answer/Scoring Sheet* (computer scan sheet);
- the totals and the grand total are written at the bottom;
- the *Answer/Scoring Sheet* is complete and correct;
- a copy has been made for school records; and
- only a pencil is used to complete the *Answer/Scoring Sheets*, by both students and markers.

Once marking is completed, please forward the *Answer/Scoring Sheets* to Manitoba Education and Youth (for more information see the *Administration Manual for Supervising Teachers*).

A. Scoring the Selected-Response Questions

Please follow the instructions on the *Answer Key for Selected-Response Questions* on page 5 for Choice I or on page 7 for Choice II.

B. Scoring the Constructed-Response Questions

The respective marking key or scoring rubric should be used in conjunction with the *Senior 1 Mathematics: Manitoba Curriculum Framework of Outcomes and Senior 1 Standards* when assigning scores to student responses.

B.1 Scoring Guidelines—Restricted-Response Questions (with or without Explanation)

Each question of this type is designed to elicit a well-defined response according to the associated specific outcome(s) and relevant mathematical processes. Their purpose is to determine whether a student meets the standards for the course (level 2) as they relate to the knowledge and skills associated with the question. **Scoring is in whole-mark intervals (there are no half-marks).**

To receive full marks, a student's response must be complete and correct. Partial marks may be awarded for a "relevant strategy" with execution errors. *A relevant strategy is defined as one that is consistent with the specific outcome(s) and mathematical processes associated with the question that, if properly executed, would lead to the correct answer.* Where alternative strategies are possible, the *Marking Key* makes mention of them.

For some questions the *Marking Key* identifies errors that are “trivial”. No marks are to be deducted for such errors. In order to be considered trivial, an error must be conceptually unrelated to the outcome(s) associated with the question and not lead to a mathematically incorrect answer. Such errors are distinct from minor errors (generally not conceptual in nature but leading to an incorrect answer) and major errors (an omission or error that is conceptual in nature).

B.2 Scoring Guidelines—Open-Response Questions

These questions are designed to elicit student responses at any of the three levels of achievement defined in *Senior 1 Mathematics: Manitoba Curriculum Framework of Outcomes and Senior 1 Standards*. The rubrics contain the language of the curricular standards in order to facilitate scoring in a manner that is consistent with those standards. The recommended procedure for scoring student responses is as follows:

1. Read the relevant specific outcome(s) in *Senior 1 Mathematics Framework of Manitoba Outcomes and Senior 1 Standards*.
2. Read the possible solution(s) provided in this document.
3. Study the student exemplars provided and the rationales for the assigned scores.
4. Carefully view all of the student’s response and decide which of the three levels of achievement (“exceptional understanding”, “good understanding” or “limited understanding”) best applies. Whether the response clearly fits into one category or straddles two, this process will narrow down the number of possible scores that can be assigned to the response.
5. Compare the features of the student’s response with the general performance indicators accompanying the mark values and the specific performance indicators (criteria) contained in the rubric. Note that the specific performance indicators only typify a student’s response in a given score category. An exact match is not anticipated.

C. Assistance

If, during marking, any marking issue arises that cannot be resolved locally, please call Manitoba Education and Youth at the earliest opportunity to advise and/or seek assistance. If required, we will connect you to an advisor. Also, please be sure to notify us before making any modifications to the answer keys or scoring rubrics. Contact person: Ken Horton at 945-2576 (1 800 282-8069, extension 2576).

SCORING GUIDELINES

Answer Key for Selected-Response Questions

Answer Key for Selected-Response Questions—Choice I

If you are using this sheet by punching out holes corresponding to the correct answers and overlaying this sheet on the *Answer/Scoring Sheet*, then

- 1) check the student's responses for multiple bubbles first (questions with multiple bubbles are to be scored as "0");
- 2) overlay this page on the *Answer/Scoring Sheet*; and
- 3) count the number of correct responses, excluding questions with multiple responses, if any.

You may also score the selected-response questions by making a transparency of this page and overlaying it on the *Answer/Scoring Sheet*.

Remember to write the total score for the selected-response questions at the bottom of the *Answer/Scoring Sheet*.

SELECTED RESPONSE ANSWER

Fill in the best answer for each question.

- | | | | |
|----|--|----|--|
| 1 | ☐ A ☐ B ☒ C ☐ D | 14 | ☐ A ☐ B ☒ C ☐ D |
| 2 | ☐ A ☒ B ☐ C ☐ D | 15 | ☐ A ☒ B ☐ C ☐ D |
| 3 | ☐ A ☐ B ☒ C ☐ D | 16 | ☐ A ☒ B ☐ C ☐ D |
| 4 | ☒ A ☐ B ☐ C ☐ D | 17 | ☐ A ☐ B ☐ C ☒ D |
| 5 | ☐ A ☐ B ☒ C ☐ D | 18 | ☐ A ☒ B ☐ C ☐ D |
| 6 | ☐ A ☒ B ☐ C ☐ D | 19 | ☒ A ☐ B ☐ C ☐ D |
| 7 | ☒ A ☐ B ☐ C ☐ D | 20 | ☐ A ☐ B ☐ C ☒ D |
| 8 | ☒ A ☐ B ☐ C ☐ D | 21 | ☐ A ☐ B ☒ C ☐ D |
| 9 | ☐ A ☒ B ☐ C ☐ D | 22 | ☐ A ☐ B ☒ C ☐ D |
| 10 | ☐ A ☐ B ☐ C ☒ D | 23 | ☐ A ☒ B ☐ C ☐ D |
| 11 | ☐ A ☒ B ☐ C ☐ D | 24 | ☒ A ☐ B ☐ C ☐ D |
| 12 | ☐ A ☐ B ☐ C ☒ D | 25 | ☐ A ☒ B ☐ C ☐ D |
| 13 | ☒ A ☐ B ☐ C ☐ D | | |

Answer Key for Selected-Response Questions—Choice II

If you are using this sheet by punching out holes corresponding to the correct answers and overlaying this sheet on the *Answer/Scoring Sheet*, then

- 1) check the student's responses for multiple bubbles first (questions with multiple bubbles are to be scored as "0");
- 2) overlay this page on the *Answer/Scoring Sheet*; and
- 3) count the number of correct responses, excluding questions with multiple responses, if any.

You may also score the selected-response questions by making a transparency of this page and overlaying it on the *Answer/Scoring Sheet*.

Remember to write the total score for the selected-response questions at the bottom of the *Answer/Scoring Sheet*.

SELECTED RESPONSE ANSWER

Fill in the best answer for each question.

1	☐ A ☐ B ☒ C ☐ D	14	☐ A ☐ B ☒ C ☐ D
2	☐ A ☒ B ☐ C ☐ D	15	☐ A ☐ B ☒ C ☐ D
3	☐ A ☐ B ☒ C ☐ D	16	☐ A ☐ B ☒ C ☐ D
4	☒ A ☐ B ☐ C ☐ D	17	☐ A ☐ B ☐ C ☒ D
5	☐ A ☐ B ☒ C ☐ D	18	☐ A ☒ B ☐ C ☐ D
6	☐ A ☒ B ☐ C ☐ D	19	☒ A ☐ B ☐ C ☐ D
7	☐ A ☐ B ☐ C ☐ D	20	☐ A ☐ B ☐ C ☒ D
8	☐ A ☐ B ☐ C ☐ D	21	☐ A ☐ B ☒ C ☐ D
9	☐ A ☒ B ☐ C ☐ D	22	☐ A ☐ B ☒ C ☐ D
10	☐ A ☐ B ☐ C ☒ D	23	☐ A ☐ B ☐ C ☒ D
11	☐ A ☒ B ☐ C ☐ D	24	☒ A ☐ B ☐ C ☐ D
12	☐ A ☐ B ☐ C ☒ D	25	☐ A ☐ B ☒ C ☐ D
13	☐ A ☐ B ☐ C ☐ D		

SCORING GUIDELINES

Marking Key and Standards-Based Scoring Rubrics (including student exemplars)

Question No. 26

Specific Outcome: A.1 (OR)

QUESTION AND ANSWER KEY

26. OPEN-RESPONSE QUESTION

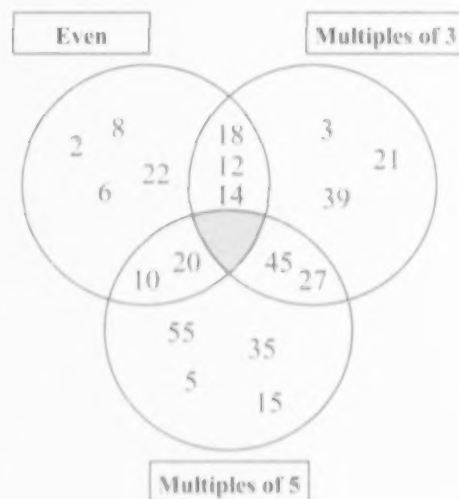
4 marks

Dan draws and fills in a diagram using whole numbers.

a) Write a number that belongs in the shaded region.

Sample responses:

0, 30, 60, 90, 120, 150



b) Dan placed some numbers incorrectly while filling in his diagram.

- Explain one of his errors.

27 is not divisible by 5

6 is also a multiple of 3

14 is not divisible by 3

15 is also a multiple of 3

c) • State one number (not zero) that does not fit in any of the circles.

- Explain your reasoning.

Possible numbers:

1, 7, 11...

$\sqrt{3}$, π , 0.12345...

-1, -2, -3...

$\frac{1}{2}$, 0.5, $2\frac{3}{4}$...

7, 11, 13...

Possible explanations:

– it would be a number that is odd and not a multiple of 3 or 5

– numbers that are not rational numbers

– negative integers

– fractions/decimals

– prime numbers that are bigger than 5

Scoring Rubric

	Score and General Performance Indicators	Specific Performance Indicators/Criteria
Level 1 limited understanding	1 weak attempt	- any 1 criterion met
Level 2 good understanding	2 reasonable strategy, minor errors and/or omissions	- any 2 criteria met
	3 response complete with one minor error or omission	- any 3 criteria met
Level 3 exceptional understanding	4 response complete, correct, showing insightful thinking, critical thinking, or a generalization	- all 4 criteria met

Criteria:

1. correct number in a)
2. correct explanation of error in b)
3. correct number in c)
4. correct explanation in c)

Marker note(s):

- accept description of sets or groups of numbers, for example: all irrational numbers, for criterion 4

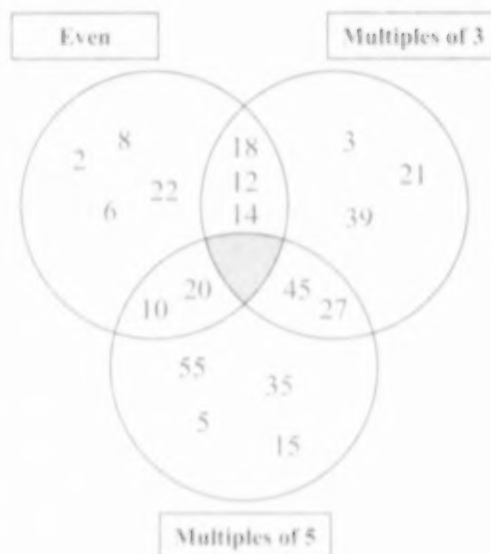
EXEMPLARS

26. OPEN-RESPONSE QUESTION

Dan draws and fills in a diagram using **whole numbers**.

- a) Write a number that belongs in the shaded region.

30



- b) Dan placed some numbers incorrectly while filling in his diagram.
- Explain one of his errors.

27 is not a multiple of 5

- c) • State one number (not zero) that does not fit in any of the circles.
- Explain your reasoning.

11

Odd numbers that are not multiples of 3 or 5

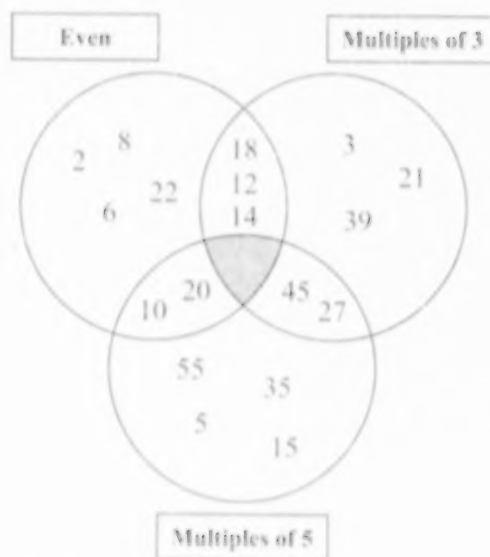
4 marks

- criteria 1, 2, 3 and 4 met

4 marks

26. OPEN-RESPONSE QUESTION

Dan draws and fills in a diagram using **whole numbers**.



- a) Write a number that belongs in the shaded region.

30

- b) Dan placed some numbers incorrectly while filling in his diagram.
- Explain one of his errors.

14 is an even number but not a multiple of 3.

- c) • State one number (not zero) that does not fit in any of the circles.
• Explain your reasoning.

a set of numbers that would not fit in the diagram would be the prime numbers, for they can not be even or they would be a multiple of 2, can't be a multiple of 3 or 5.

So prime numbers cannot fit in this diagram.

3 marks

- criteria 1, 2, and 4 met

4 marks

Question No. 27

Specific Outcome: B.1 (RR/E)

◆ Question

2 marks

The students in your school voted to elect a president for the student council.

- Was this election the result of a sampling or the result of a census?
- Explain your reasoning.

◆ Answer Key

This is the result of a census because all students vote.

OR _____

This is the result of sampling because only some students bother to vote, not everybody does.

OR _____

This is the result of sampling because only certain grades vote.

Possible 1 mark answers:

This is a sampling because all of the students voted.

OR _____

This is a census because only some of the students voted.

Marking Key

2 marks:

a selection is made with
clear rationale

1 mark:

selects one and
explains the other
or

1 mark:

an explanation is given
without stating "sampling"
or "census"

0 marks:

stating only "sampling" or
"census"

Question No. 28

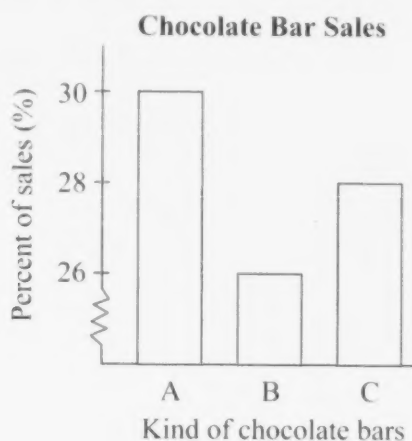
Specific Outcome: B.2 (RR/E)

◆ Question

2 marks

A chocolate bar company compares its sales of three kinds of chocolate bars in some parts of Manitoba.

- a) How could this data have been collected to avoid bias?
- b) The company claims that bar A is **much more** popular than bar B. Using the graph, explain whether or not the company's conclusion is reasonable.



◆ Answer Key

Possible answers:

- a)
 - By determining how many chocolate bars are sold from all the stores in the province.
 - Random survey of stores across Manitoba that sell all three chocolate bars.
 - Other answers possible.
- b) The conclusion is not reasonable. Chocolate Bar A sells only about 4% more chocolate bars than Chocolate Bar B.

OR

The conclusion is reasonable because 4% is a large/significant difference.

i.e., 4% of \$200 000 000 is \$8 000 000

Marking Key

2 marks:

- 1 mark for an appropriate explanation in a)
- 1 mark for correct explanation in b)

Marker note(s):

- *do not award mark in b) if student writes "not reasonable" without justification*

Question No. 29

Specific Outcomes: B.3 (RR/E)

◆ Question

3 marks

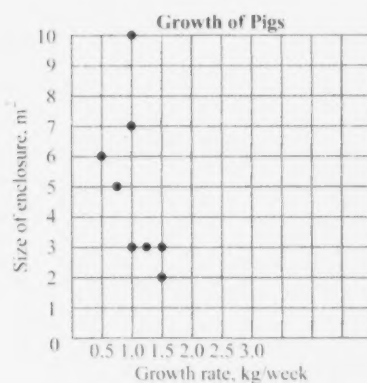
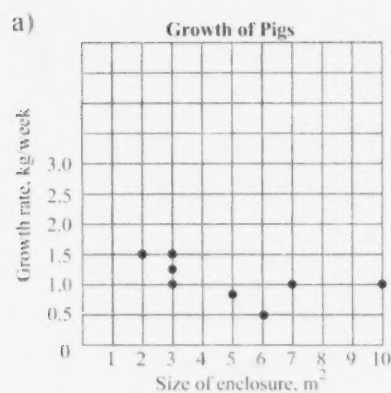
The following data were collected by a researcher studying the relationship between the growth rate of pigs and the size of the pigs' enclosures.



Size of enclosure (m^2)	2	7	3	3	5	6	10	3
Growth rate (kg/week)	1.5	1.0	1.0	1.5	0.8	0.5	1.0	1.2

- Create the scatterplot for the data above.
 - Label your scatterplot.
- What is the independent variable on your scatterplot?

◆ Answer Key



- the variable on the x-axis of the student's graph

Marking Key

3 marks:

- 1 mark for correct labels and scales
- 1 mark for points plotted correctly in a)
- 1 mark for correctly identifying the independent variable on their graph in b)

Marker note(s):

- no penalty for no title in a)
- 1 incorrectly plotted point in a) is a trivial error (no deduction)
- answer in b) should reflect the student's answer (scatterplot) in a)

Question No. 30

Specific Outcomes: C.8 and C.6 (RR)

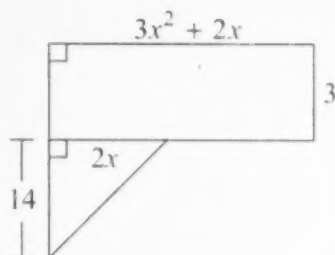
◆ Question

3 marks

a) Write the algebraic expression for the area of the rectangle.

b) Write the algebraic expression for the area of the triangle.

c) Write the **simplified** algebraic expression for the total area of the figure.



Marking Key

3 marks:

- 1 mark for correct expression for area of the rectangle
- 1 mark for correct expression for the area of the triangle
- 1 mark for correct simplification of expression for area based on answers in a) and b)

◆ Answer Key

a) $3(3x^2 + 2x)$ or $9x^2 + 6x$

b) $\frac{1}{2}(2x)(14)$ or $14x$

c) $9x^2 + 20x$

Question No. 31

Specific Outcomes: C.10, C.8 and A.1 (OR)

QUESTION AND ANSWER KEY

31. OPEN-RESPONSE QUESTION

4 marks

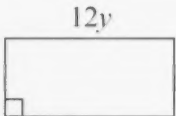
- a) Create the dimensions of two different rectangles that each have an area of $12xy$.

Sample responses, others are possible:

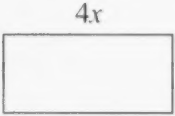
$(12xy)(1)$	$(24x)\left(\frac{1}{2}y\right)$
$(6xy)(2)$	$(6x)(2y)$
$(4xy)(3)$	$(4x)(3y)$
$(12xy)(y)$	$(12y)(x)$

- b) • Using one of your rectangles, state one or more values that are impossible for x or y .
• Explain your reasoning.

Appropriate response depends on student's dimensions:

x or y can't be 0 or else it wouldn't be a rectangle. e.g. 

OR

x or y can't be negative because sides can't have a negative length. e.g. 

Scoring Rubric

	Score and General Performance Indicators	Specific Performance Indicators/Criteria
Level 1 limited understanding	1 weak attempt	- any 1 criterion met
Level 2 good understanding	2 reasonable strategy, minor errors and/or omissions	- any 2 criteria met
	3 response complete with one minor error or omission	- any 3 criteria met
Level 3 exceptional understanding	4 response complete, correct, showing insightful thinking, critical thinking, or a generalization	- all 4 criteria met

Criteria:

1. 1 set of correct dimensions in a)
2. a different set of correct dimensions in a)
3. impossible value(s) for x or y stated in b)
4. impossible value(s) for x or y explained in b)

Marker note(s):

- if a student states x and/or y values and explains that they make length less than width, award 1 mark for criterion 4, but not criterion 3

EXEMPLARS

31. OPEN-RESPONSE QUESTION

- a) Create the dimensions of two different rectangles that each have an area of $12xy$.

Rectangle 1

$$(4)(3xy)$$

Rectangle 2

$$(2y)(6x)$$

- b) • Using one of your rectangles, state one or more values that are impossible for x or y .
• Explain your reasoning.

$(6x)(2y)$ Negative numbers, such as $-3=x$ and $-7=y$ are not realistic because you can't have a width of -14 and a length of -18 . Widths and lengths need to be positive numbers.

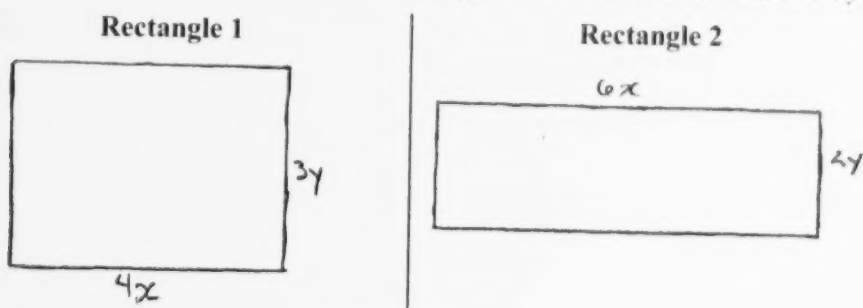
4 marks

- criteria 1, 2, 3 and 4 met

4 marks

31. OPEN-RESPONSE QUESTION

- a) Create the dimensions of two different rectangles that each have an area of $12xy$.



- b) • Using one of your rectangles, state one or more values that are impossible for x or y .
 • Explain your reasoning.

From rectangle 1 the values that are not realistic are $x=6$ and $y=7$
 because that is too big of an area for a small rectangle.

2 marks

- criteria 1, and 2 met

4 marks

Question No. 32

Specific Outcome: E.2 (RR/E)

◆ Question

3 marks

Jill's solution to the equation $5(x - 1) = 3(x - 3)$ is shown below.

$$5(x - 1) = 3(x - 3)$$

$$5x - 1 = 3x - 9$$

$$8x = -8$$

$$x = -1$$

- a) Explain the two errors that Jill made.
- b) Write the correct solution to the equation.

◆ Answer Key

- a) She didn't multiply the -1 by 5 (or 1 by 5).
She added $3x$ to $5x$ instead of subtracting $3x$ from $5x$.

b) $5(x - 1) = 3(x - 3)$

$$5x - 5 = 3x - 9$$

$$2x = -4$$

$$x = -2$$

Marking Key

3 marks:

- 1 mark for explaining 1 error
- 1 mark for explaining the other error
- 1 mark for correct solution of equation

Marker note(s):

- if errors in a) are correctly identified but not explained, deduct 1 mark
- work not needed in b) to award mark

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Question No. 33

Specific Outcome: G.1 (OR)

QUESTION AND ANSWER KEY

33. OPEN-RESPONSE QUESTION

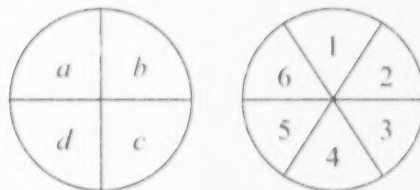
4 marks

- a) What is the probability of getting 3 and *red* when the spinners are each spun once?

$$\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$$

Sample response, others are possible:

- b) • Design two different spinners that, when both are spun, can result in a probability of $\frac{1}{24}$.



- Using your two spinners, justify how a probability of $\frac{1}{24}$ is obtained.

$$\begin{aligned} p(a \text{ and } 1) &\text{ or } \frac{1}{4} \times \frac{1}{6} \\ &= \frac{1}{24} \end{aligned}$$

OR

$p(b \text{ and } 2)$ b on first spinner and 2 on second spinner

- c) Describe the difference between theoretical probability and experimental probability.

theoretical probability: outcomes that should occur

experimental probability: outcomes that do occur during an experiment

Scoring Rubric

	Score and General Performance Indicators	Specific Performance Indicators/Criteria
Level 1 limited understanding	1 weak attempt	- any 1 criterion met
Level 2 good understanding	2 reasonable strategy, minor errors and/or omissions	- any 2 criteria met
	3 response complete with one minor error or omission	- any 3 criteria met
Level 3 exceptional understanding	4 response complete, correct, showing insightful thinking, critical thinking, or a generalization	- all 4 criteria met

Criteria:

1. correct calculation of probability in a)
2. spinners designed in b) that have a result with $p = \frac{1}{24}$ in b)
3. justification in b), such as by providing a result and showing $p = \frac{1}{24}$
4. reasonable explanation in c)

Marker note(s):

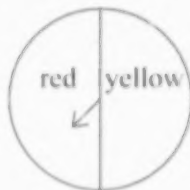
- deduct a maximum of one mark for not identifying outcomes in b)
- in b) addition can be correct if accompanied by an **or** statement

EXEMPLARS

33. OPEN-RESPONSE QUESTION

- a) What is the probability of getting 3 and red when the spinners are each spun once?

$$\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$$



- b) • Design two different spinners that, when both are spun, can result in a probability of $\frac{1}{24}$.



- Using your two spinners, justify how a probability of $\frac{1}{24}$ is obtained.

the probability of getting red on one spinner and # 1 on the other is:

$$\frac{1}{4} \times \frac{1}{6} = \frac{1}{24}$$

- c) Describe the difference between theoretical probability and experimental probability.

theoretical probability is what supposed to happen, experimental is what happens when you do it

4 marks

- criteria 1, 2, 3 and 4 met

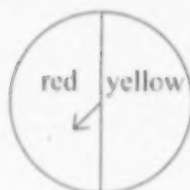
4 marks

33. OPEN-RESPONSE QUESTION

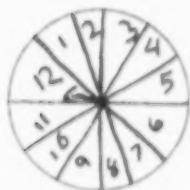
- a) What is the probability of getting 3 and red when the spinners are each spun once?

$$\frac{1}{4} \times \frac{1}{2}$$

$$\frac{1}{8}$$



- b) • Design two different spinners that, when both are spun, can result in a probability of $\frac{1}{24}$.



- Using your two spinners, justify how a probability of $\frac{1}{24}$ is obtained.

well when you spin you have a

$\frac{1}{24}$ to land on anything

12 and red is $\frac{1}{24}$ chance -ed.
11 and blue is $\frac{1}{24}$ chance

- c) Describe the difference between theoretical probability and experimental probability.

its what happens and how

3 marks

- criteria 1, 2 and 3 met

4 marks

Question No. 34

Specific Outcomes: I.3, I.4 and F.2 (OR)

QUESTION AND ANSWER KEY

34. OPEN-RESPONSE QUESTION

6 marks

Mary plays soccer every day near the lake. Afterwards, she has to get water from the lake and carry it to the cabin. To save time, she walks in a straight line to the lake, gets some water, and goes directly to the cabin.

- a) Calculate the total distance Mary travels on Path 1 from her starting point to her cabin.

$$c^2 = a^2 + b^2$$

$$c^2 = 84^2 + 51^2$$

$$= 7056 + 2601$$

$$= 9657$$

$$c = 98.3 \text{ m}$$

$$98.3 + 17 = 115.3 \text{ m}$$

$$\tan x = \frac{51}{84}$$

$$\angle x = 31.3^\circ$$

OR

$$\sin 31.3 = \frac{51}{x}$$

$$x = 98.2$$

$$98.2 + 17 = 115.2 \text{ m}$$

- b) • Calculate the measure of angle x .
• Show your work.

$$\tan x = \frac{51}{84}$$

OR

$$\sin x = \frac{51}{98.3}$$

OR

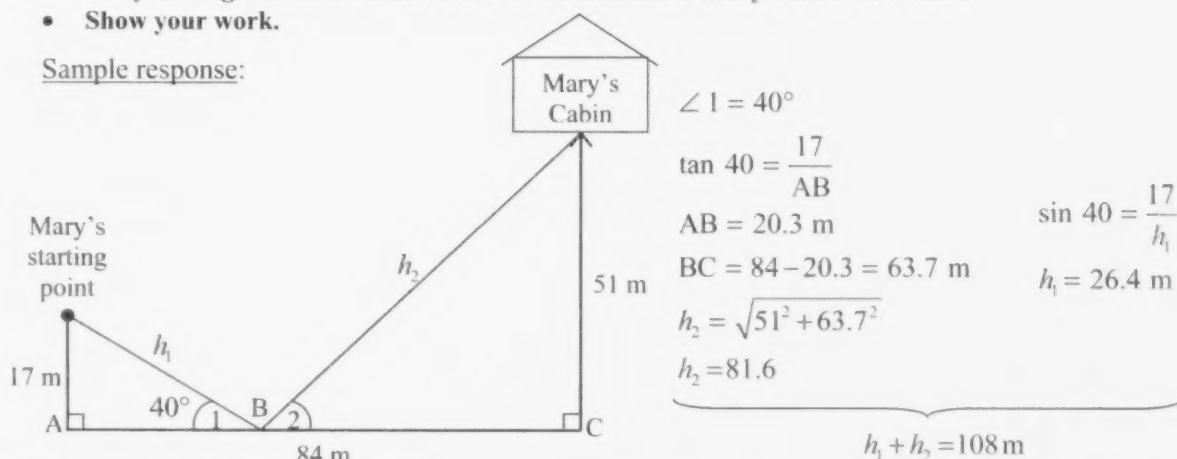
$$\cos x = \frac{84}{98.3}$$

$$\angle x = 31.3^\circ = 31^\circ$$

The next day, after playing soccer, Mary chooses a different path to get water and return to the cabin.

- c) • Create and label an appropriate measure for one angle ($\angle 1$ or $\angle 2$).
• Use your angle measure to calculate the total distance Mary travels on Path 2.
• Show your work.

Sample response:



Scoring Rubric

	Score and General Performance Indicators	Specific Performance Indicators/Criteria
Level 1 limited understanding	1 weak attempt	- any 1 criterion met
	2 reasonable attempt, major errors or omissions	- any 2 criteria met
Level 2 good understanding	3 reasonable strategy, minor errors and/or omissions	- any 3 criteria met
	4 sound strategy, mostly complete, minor errors	- any 4 criteria met
	5 response complete with one minor error or omission	- any 5 criteria met
Level 3 exceptional understanding	6 response complete, correct, showing insightful thinking, critical thinking, or a generalization	- all 6 criteria met

Criteria:

1. correct answer in a)
2. correct trigonometry ratio in b)
3. correct angle in b) based on student's ratio
4. correct calculation of one side in c) using angle
5. appropriate strategy to find total distance
6. correct distance based on the angle chosen

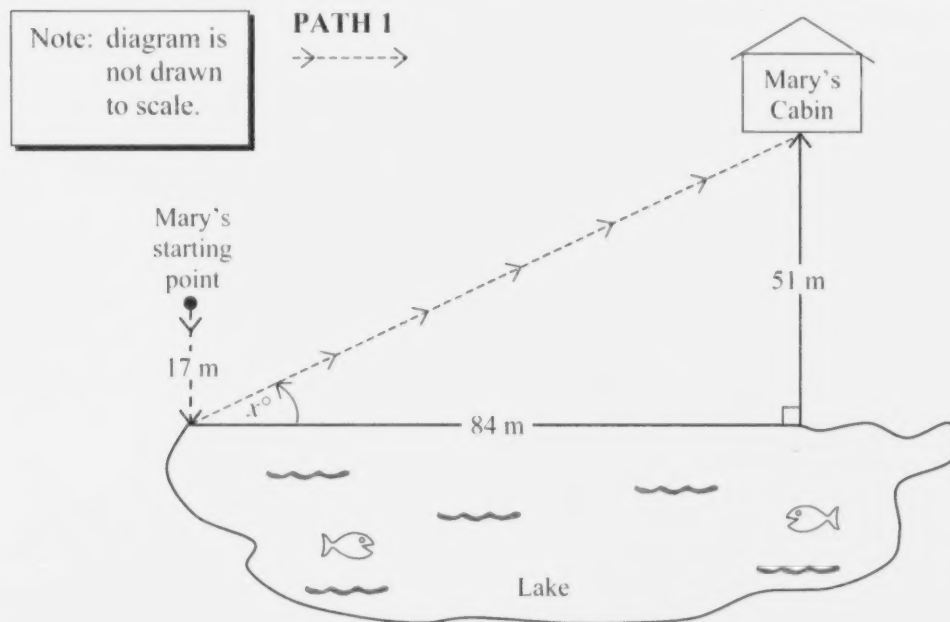
Marker note(s):

- no mark awarded for criterion 5 if student has $\angle 1 = \angle 2$ and the measure is not 39° (similar triangles)
- meter not included in answer a) or c) -- trivial error, no marks deducted
- part b) may be done in a)
- if student arbitrarily gives the measures for $\angle 1$ **and** $\angle 2$, and calculates total distance based on these angles, deduct one mark

EXEMPLARS

34. OPEN-RESPONSE QUESTION

Mary plays soccer every day near the lake. Afterwards, she has to get water from the lake and carry it to the cabin. To save time, she walks in a straight line to the lake, gets some water, and goes directly to the cabin.



- a) Calculate the **total** distance Mary travels on Path 1 from her starting point to her cabin.

$$\begin{aligned}
 c^2 &= a^2 + b^2 \\
 c^2 &= 84^2 + 51^2 \\
 c^2 &= 7056 + 2601 \\
 c &= 98.3
 \end{aligned}$$

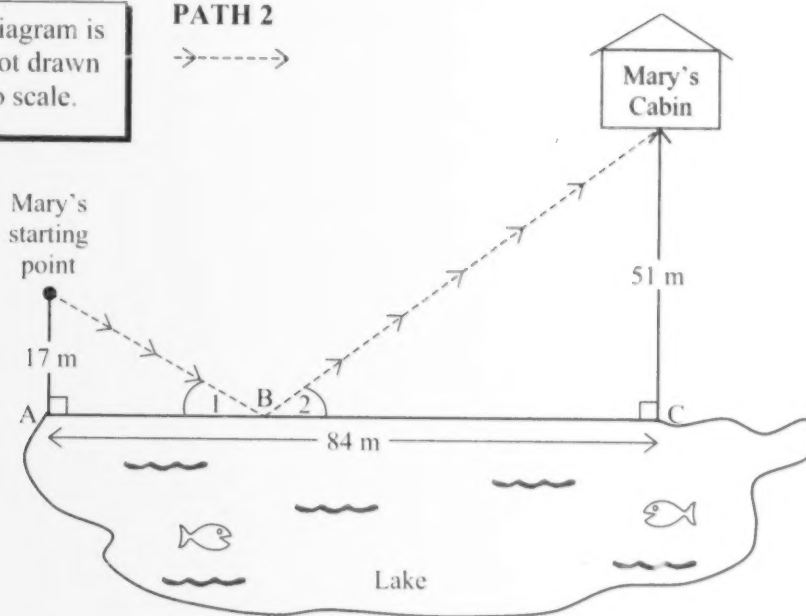
- b) • Calculate the measure of angle x .
• Show your work.

$$\begin{aligned}
 \angle x &= \tan^{-1} \frac{b}{a} \\
 &= \tan^{-1} \left(\frac{51}{84} \right) \\
 &= 31.26^\circ
 \end{aligned}$$

The next day, after playing soccer, Mary chooses a different path to get water and return to the cabin.

Note: diagram is not drawn to scale.

PATH 2



- c) • Create and label an appropriate angle for one angle ($\angle 1$ or $\angle 2$).
- Use your angle measure to calculate the total distance Mary travels on Path 2.
- Show your work.

$$\begin{aligned}\angle 1 &= 30^\circ \\ \sin 30 &= \frac{17}{x} \\ x &= 34\end{aligned}$$

$$\begin{aligned}c^2 &= a^2 + b^2 \\ 34^2 &= 17^2 + b^2 \\ 867 &= b^2 \\ 29.4 &= b = AB\end{aligned}$$

$$84 - 29.4 = 54.6 = BC$$

$$\begin{aligned}c^2 &= a^2 + b^2 \\ c^2 &= 54.6^2 + 51^2 \\ c^2 &= 2981.16 + 2601 \\ c^2 &= 5582.16 \\ c &= 74.7\text{ m}\end{aligned}$$

Total Distance:

$$34 + 74.7 = 108.7\text{ m}$$

5 marks

- criteria 2, 3, 4, 5 and 6 met

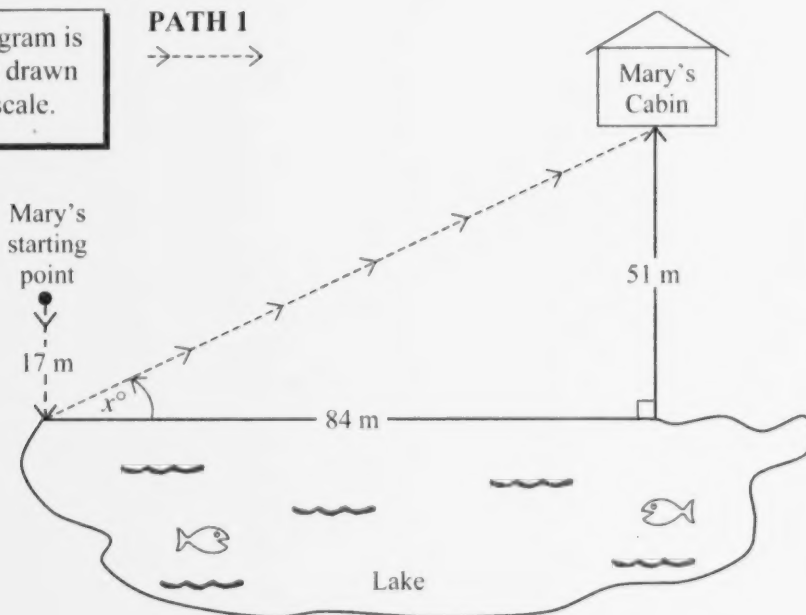
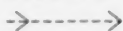
6 marks

34. OPEN-RESPONSE QUESTION

Mary plays soccer every day near the lake. Afterwards, she has to get water from the lake and carry it to the cabin. To save time, she walks in a straight line to the lake, gets some water, and goes directly to the cabin.

Note: diagram is not drawn to scale.

PATH 1



- a) Calculate the **total** distance Mary travels on Path 1 from her starting point to her cabin.

$$\tan x = \frac{51}{84} = 31$$

$$\sin 31 = \frac{51}{x} = 99 + 17 = 116$$

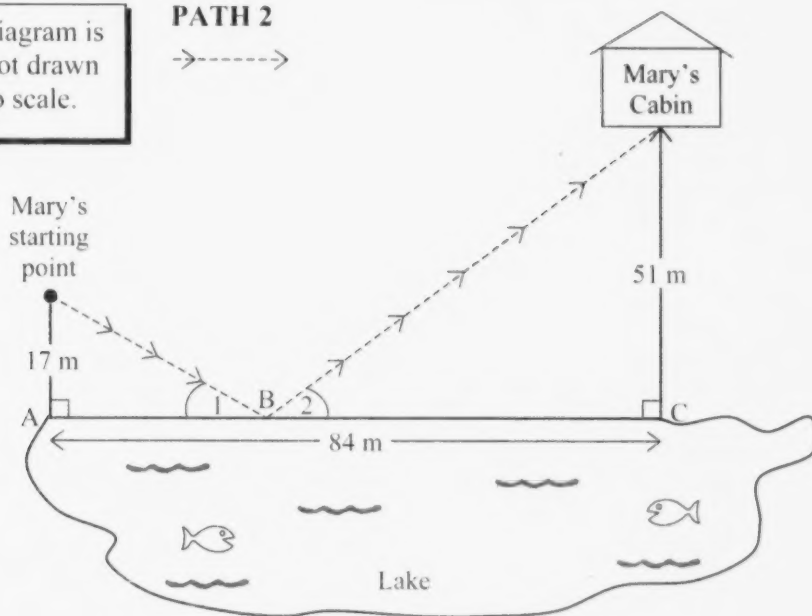
- b) • Calculate the measure of angle x .
• Show your work.

$$\tan x = \frac{51}{84} = 31^\circ$$

The next day, after playing soccer, Mary chooses a different path to get water and return to the cabin.

Note: diagram is not drawn to scale.

PATH 2



- c) • Create and label an appropriate measure for one angle ($\angle 1$ or $\angle 2$).
- Use your angle measure to calculate the total distance Mary travels on Path 2.
- Show your work.

similar Δ 's
 $84 \div 4 = 21 + 63$

$$\tan x = \frac{17}{21} = 39$$

$$\sin 39 = \frac{51}{x}$$

$$x = 65.6$$

$$\sin 39 = \frac{17}{x}$$

$$x = 27$$

$$27 + 65.6 = 92.6$$

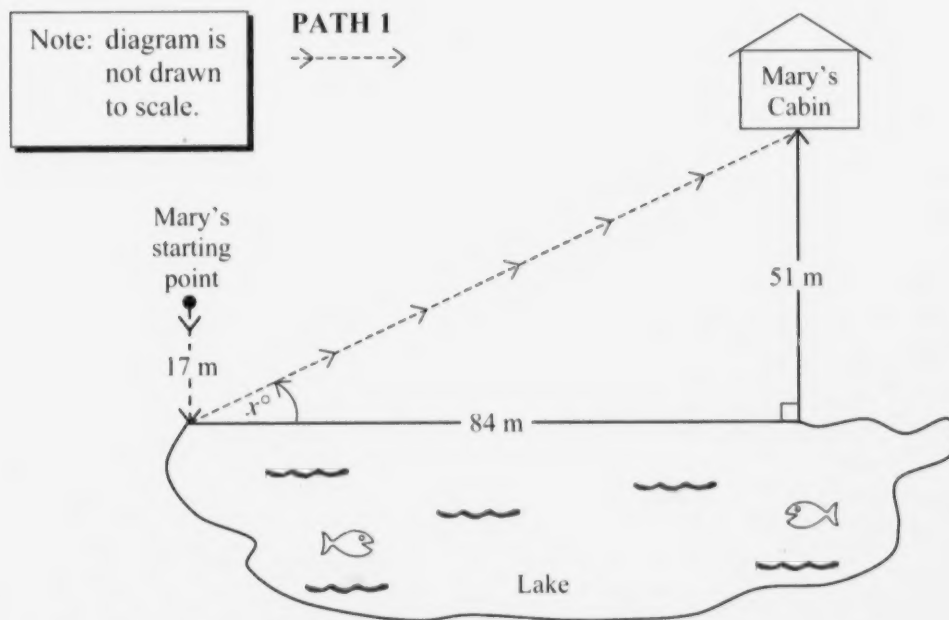
5 marks

- criteria 1, 2, 3, 4 and 5met

6 marks

34. OPEN-RESPONSE QUESTION

Mary plays soccer every day near the lake. Afterwards, she has to get water from the lake and carry it to the cabin. To save time, she walks in a straight line to the lake, gets some water, and goes directly to the cabin.



- a) Calculate the **total** distance Mary travels on Path 1 from her starting point to her cabin.

$$\begin{aligned}
 a^2 + b^2 &= c^2 \\
 84^2 + 51^2 &= c^2 \\
 7056 + 2601 &= c^2 \\
 9657 &= c^2 \\
 98.3 \text{ m} &= c
 \end{aligned}
 \quad \Rightarrow \quad
 \begin{aligned}
 17 + 98.3 \\
 &= 115.1 \text{ m}
 \end{aligned}$$

- b) • Calculate the measure of angle x .
• Show your work.

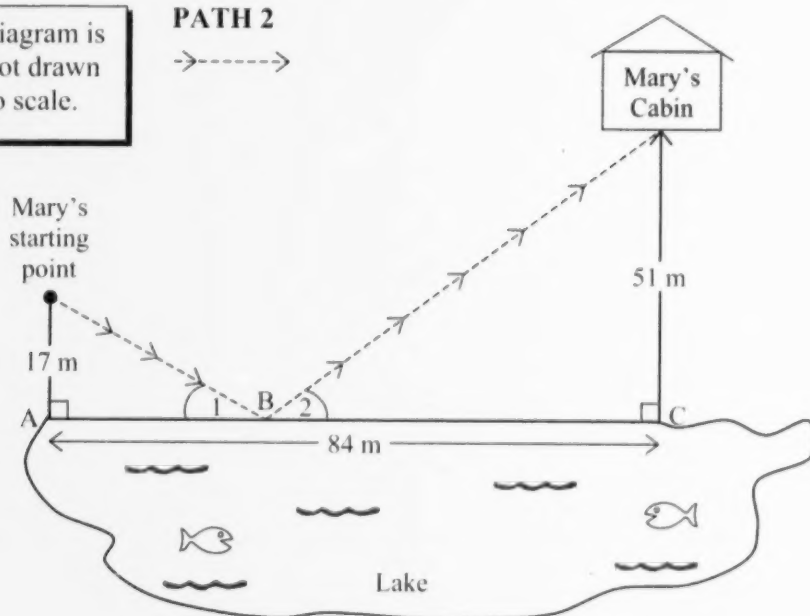
$$\begin{aligned}
 &\tan^{-1}\left(\frac{51}{84}\right) \\
 &\angle x = 31^\circ
 \end{aligned}$$

The next day, after playing soccer, Mary chooses a different path to get water and return to the cabin.

Note: diagram is not drawn to scale.

PATH 2

→-----→



- c) • Create and label an appropriate angle for one angle ($\angle 1$ or $\angle 2$).
- Use your angle measure to calculate the total distance Mary travels on Path 2.
- Show your work.

$$\angle 2 = 45^\circ \quad \text{B to house}$$

$$\sin 45^\circ = \frac{51}{x}$$

$$x = 72.1 \text{ m}$$

$$\sin 45^\circ = \frac{17}{x}$$

$$x = 12 \text{ m}$$

4 marks

- criteria 1, 2, 3 and 4 met

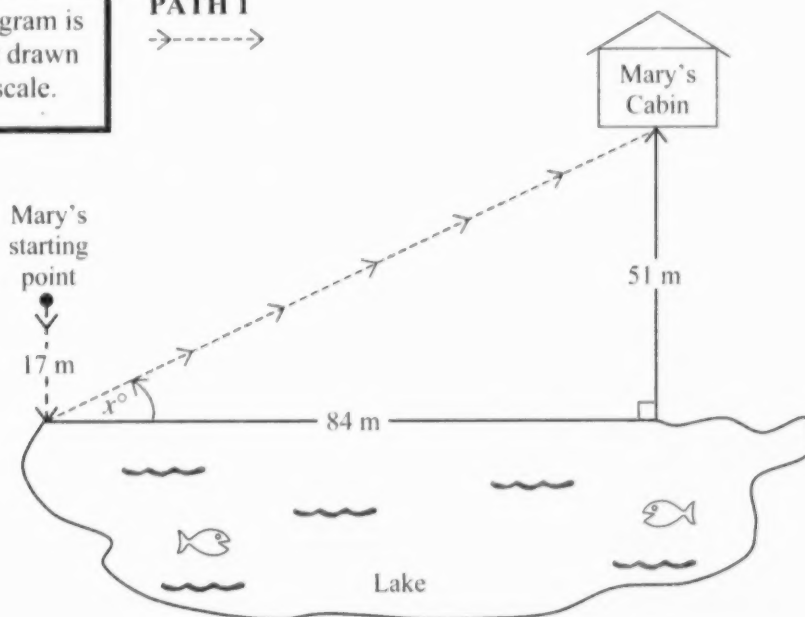
6 marks

34. OPEN-RESPONSE QUESTION

Mary plays soccer every day near the lake. Afterwards, she has to get water from the lake and carry it to the cabin. To save time, she walks in a straight line to the lake, gets some water, and goes directly to the cabin.

Note: diagram is not drawn to scale.

PATH 1



- a) Calculate the **total** distance Mary travels on Path 1 from her starting point to her cabin.

$$\begin{aligned}
 51^2 + 84^2 &= p^2 \\
 2601 + 2056 &= p^2 \\
 p^2 &= 9657 \\
 \sqrt{9657} &= \sqrt{p^2}
 \end{aligned}$$

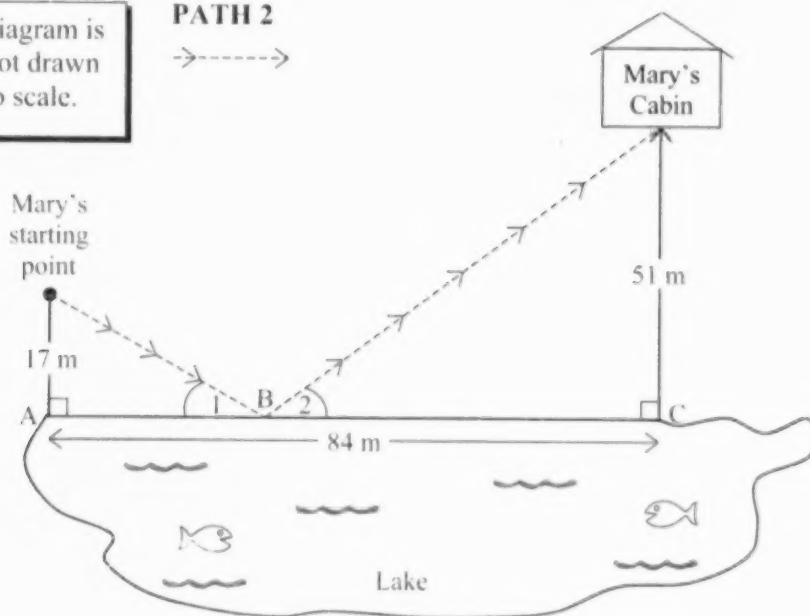
- b) • Calculate the measure of angle x .
• Show your work.

$$\begin{aligned}
 \tan x &= \frac{51}{84} \\
 x &= 0.6 \tan^{-1} \\
 x &= 31
 \end{aligned}$$

The next day, after playing soccer, Mary chooses a different path to get water and return to the cabin.

Note: diagram is not drawn to scale.

PATH 2



- c) • Create and label an appropriate measure for one angle ($\angle 1$ or $\angle 2$).
- Use your angle measure to calculate the total distance Mary travels on Path 2.
- Show your work.

$$\sin 55 = \frac{x}{17}$$

$$\tan Z = \frac{51}{84}$$

$$x = 17 \sin 55$$

$$x = 14$$

3 marks

- criteria 2, 3 and 4 met

6 marks

Question No. 35

Specific Outcome: H.1 (RR/E)

◆ Question

2 marks

Which is greater, $(-7)^2$ or -7^2 ?

Explain your reasoning.

◆ Answer Key

$$(-7)^2$$

Reasoning: $(-7)^2 = 49$

and $-7^2 = -49$

OR

The $-$ inside brackets is affected by the even exponent and is not affected when there are no brackets.

Marking Key

2 marks:

- 1 mark for correct answer
- 1 mark for correct explanation

Marker note(s):

- deduct 1 mark for incorrect calculation, e.g., 14 and -14

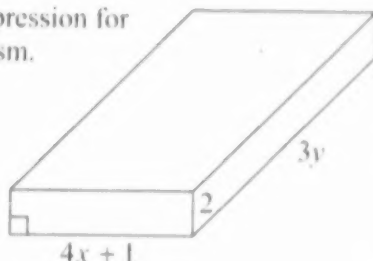
Question No. 36

Specific Outcomes: H.7, H.10 and E.2 (RR)

◆ Question

3 marks

- a) Write the **simplified** algebraic expression for the **volume** of this rectangular prism.
- b) If $x = 2$, substitute this value into your expression in a) and **simplify** it.
- c) The volume of this prism is 270 cm^3 . Knowing that $x = 2$, what is the value of y ?



Marking Key

◆ Answer Key

- a) $24xy + 6y$
- b) $54y$
- c) $y = 5$

3 marks:

- 1 mark for correct answer in a)
- 1 mark for correct answer in b) based on answer in a)
- 1 mark for correctly calculated value of y in c)

Marker note(s):

- deduct a maximum of 1 mark for not simplifying

Question No. 37

Specific Outcome: I.3 (RR)

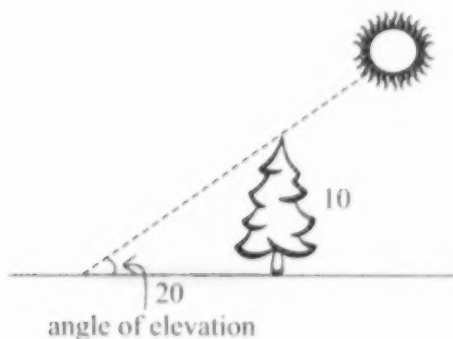
◆ Question

2 marks

A tree casts a shadow 20 metres long.

- If the tree is 10 metres high, calculate the angle of elevation to the sun using trigonometry.
- Label the diagram and show your work.

◆ Answer Key



$$\tan \angle = \frac{10}{20}$$

$$\angle = 26.6^\circ \text{ OR } 27^\circ$$

Marking Key

2 marks:

- 1 mark for correct trigonometric ratio
- 1 mark for correct answer according to ratio given by student

Marker note(s):

- if the ratio used is incorrect, award the mark for a "correct answer" **only** if the ratio used matches the dimensions placed on the diagram
- rounding off incorrectly i.e., 26 is trivial error, no mark deducted

Question No. 38—Choice I only

Specific Outcome: D.1 (RR/E)

◆ Question

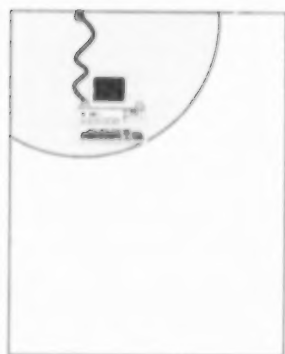
3 marks

In a room that measures 8 m by 10 m, Lucas' computer is plugged into the wall 2 metres from the corner, as shown below. This is the only outlet in the room.

- The cord is 4 m long and remains plugged in as shown. **Accurately** draw and shade the locus of points **inside** the room where Lucas can place his computer.
- State one assumption you made to draw your locus of points.

◆ Answer Key

a)



OR



b) Sample responses, other assumptions are possible:

- the computer is at the same height as the wall outlet
- there are no doorways or other furniture in the way
- there is nothing else Lucas needs to plug in with a shorter cord

Marking Key

3 marks:

- 1 mark for correct arc drawn to given scale
- 1 mark for correct shading or identifying region according to their boundary within the room
- 1 mark for reasonable assumption

Marker note(s):

- make an overhead to use as an overlay to assess correct arc drawn to given scale
- no mark awarded if complete circle is shaded
- the student may have a slightly larger circle if the assumption is that the depth of the computer is added to the length of the cord

Question No. 39—Choice I only

Specific Outcome: D.2 (RR)

◆ Question

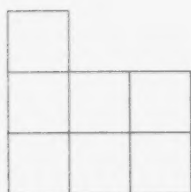
2 marks

The base plan of a 3-D model is shown.
Draw the front and right elevations.

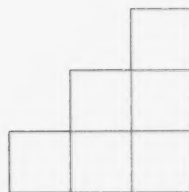
3	1	2
2	2	2
1	1	1

Front

◆ Answer Key



Front elevation



Right elevation

Marking Key

2 marks:

- 1 mark for correct front elevation
- 1 mark for correct right elevation

Marker note(s):

- award a maximum of 1 mark for 3-D images showing the correct views

Question No. 38—Choice II only

Specific Outcome: K.1 (RR)

◆ Question

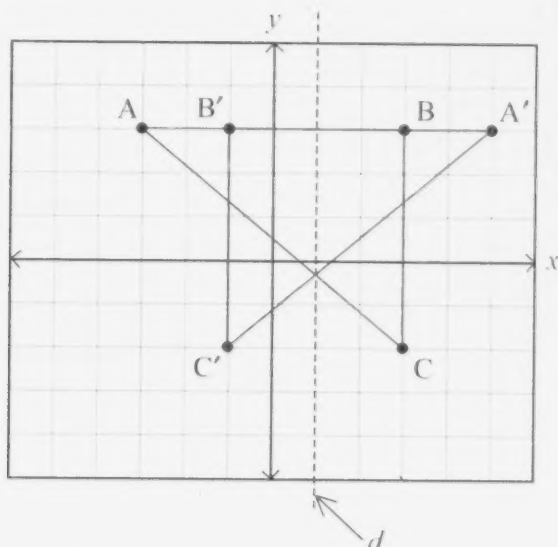
2 marks

- Draw and label the image of $\triangle ABC$ after the reflection in line “ d ”.
- Give the coordinates of A' .

$A'(\underline{\quad}, \underline{\quad})$

◆ Answer Key

a)



b) $A'(\underline{5}, \underline{3})$

Marking Key

2 marks:

- 1 mark for correct image
- 1 mark for correct coordinates according to student's image

Marker note(s):

- no deduction for missing labels on the image (trivial error)

Question No. 39—Choice II only

Specific Outcomes: K.1 and K.2 (RR/E)

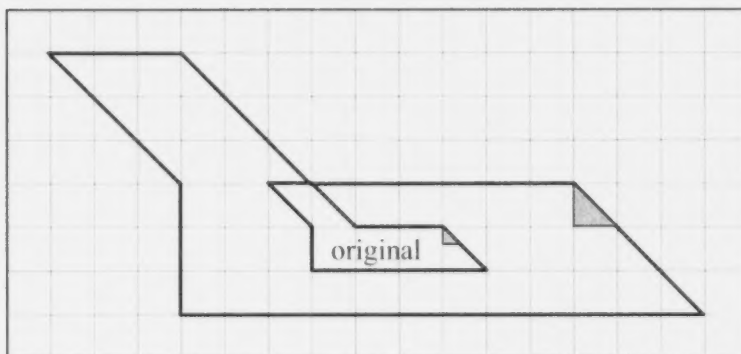
◆ Question

3 marks

- Draw the image of the figure shown by enlarging it by a scale factor of 3.
- What type of transformation is this enlargement called?
- Briefly explain how you did the transformation.

◆ Answer Key

a)



b) dilatation or dilation

c) I made the figure 3 times longer and taller by multiplying the length of each side by 3.

Marking Key

3 marks:

- 1 mark for correct image in a)
- 1 mark for correct answer in b)
- 1 mark for correct explanation in b)

Marker note(s):

- ignore size or deletion of window in image
- position of the image is irrelevant if size is correct

APPENDICES

Appendix A

SPECIFIC OUTCOME MATCH

Selected-Response Questions			Restricted-Response Questions			
Question No.	Unit(s)	Specific Outcome(s)	Question No.	Unit(s)	Specific Outcome(s)	Mark Value
1	A	1	30	C	8, 6	3
2	A	1	36	H/E	7, 10/2	3
3	A	1	37	I	3	2
4	B	5	<i>Choice I</i>			
5	B	6	39	D	2	2
6	B	4				
7	C	1	<i>Choice II</i>			
8	C	9	38	K	1	2
9	E/C	2/9, 10				
10	E	2	Restricted-Response with Explanation Questions			
11	G	3	Question No.	Unit(s)	Specific Outcome(s)	Mark Value
12	H	1	27	B	1	2
13	H	3	28	B	2	2
14	H	6	29	B	3	3
15	H	7	32	E	2	3
16	H	10	35	H	1	2
17	H	11	<i>Choice I</i>			
18	H	12	38	D	3	3
19	H	12				
20	I	1	<i>Choice II</i>			
21	J	4	39	K	1, 2	3
22	J	4				
<i>Choice I</i>			Open-Response Questions			
23	D	2	Question No.	Unit(s)	Specific Outcome(s)	Mark Value
24	D	3	26	A	1	4
25	D	3	31	C/A	10, 8/1	4
<i>Choice II</i>			33	G	1	4
23	K	2	34	I/F	3, 4/2	6
24	K	3				
25	K	4				

Appendix B

DOUBLE MARKING RECORD SHEET

FIRST MARKING
BOOKLET NO.

Marker ID	Question	Score
	26	
	27	
	28	
	29	
	30	
	31	
	32	
	33	
	34	
	35	
	36	
	37	
	38	
	39	
	Total	

DOUBLE MARKING RECORD SHEET

SECOND MARKING
BOOKLET NO.

Marker ID	Question	Score
	26	
	27	
	28	
	29	
	30	
	31	
	32	
	33	
	34	
	35	
	36	
	37	
	38	
	39	
	Total	

Appendix C

GENERATING STUDENT PROFILES—CHOICE I

Profile of Test Score by Question Type

Question Type	Test Questions	Total	÷ Maximum	× 100	= %
Selected Response	1 to 25: __		25		
Restricted Response	30 __, 36 __, 37 __, 39 __		10		
Restricted Response with Explanation	27 __, 28 __, 29 __, 32 __, 35 __, 38 __		15		
Open Response	26 __, 31 __, 33 __, 34 __		18		
Example					
Open Response	26 <u>2</u> , 31 <u>2</u> , 33 <u>1</u> , 34 <u>4</u>	9	18	05	50%

Profile of Test Score by Curricular Strand

Strand	Test Questions	Total	÷ Maximum	× 100	= %
Shape and Space	20 to 25: __ 34 __, 37 __, 38 __, 39 __		19		
Number	7 to 10: __, 12 to 19: __ 30 __, 31 __, 32 __, 35 __, 36 __		27		
Statistics and Probability	4 to 6: __, 11 __ 27 __, 28 __, 29 __, 33 __		15		
Patterns and Relations	1 to 3: __ 26 __		7		

Appendix D

GENERATING STUDENT PROFILES—CHOICE II

Profile of Test Score by Question Type

Question Type	Test Questions	Total	÷ Maximum	× 100	= %
Selected Response	1 to 25: ____		25		
Restricted Response	30 __, 36 __, 37 __, 38 __		10		
Restricted Response with Explanation	27 __, 28 __, 29 __, 32 __, 35 __, 39 __		15		
Open Response	26 __, 31 __, 33 __, 34 __		18		
Example					
Open Response	26 <u>2</u> , 31 <u>2</u> , 33 <u>1</u> , 34 <u>4</u>	9	18	05	50%

Profile of Test Score by Curricular Strand

Strand	Test Questions	Total	÷ Maximum	× 100	= %
Shape and Space	20 to 25: ____ 34 __, 37 __, 38 __, 39 __		19		
Number	7 to 10: __, 12 to 19: ____ 30 __, 31 __, 32 __, 35 __, 36 __		27		
Statistics and Probability	4 to 6: __, 11 ____ 27 __, 28 __, 29 __, 33 __		15		
Patterns and Relations	1 to 3: ____ 26 __		7		

